



LUND UNIVERSITY
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Value Creation with Lean Accounting

Optimizing utilization of resources through the value chain applying management accounting techniques in a package around management control system.

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Abstract

Title: Value Creation with Lean Accounting - optimizing utilization of resources through the value chain applying management accounting techniques in a package around management control system.

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Keywords: Strategic management accounting, lean accounting, target costing, time driven activity based costing, value chain management.

Purpose: The purpose of this paper is to search how the accounting techniques can support optimization of resources utilization leading to create value for the organisation connecting contemporary management accounting techniques together in a package around cybernetic control. The secondary objective is to eliminate the shortcomings of traditional accounting using emerging methods of accounting.

Methodology: This paper follows the qualitative research approach taking into account mainly the inductive method designed as a single case study.

Theoretical perspectives: The theoretical perspective build around the framework of Malmi and Brown, 2008 extending cybernetic control connecting the theory of contemporary management accounting techniques attached to lean principles.

Empirical foundation: The empirical data is based on a classic single case-control study following the embedded design includes survey data, the theoretical review of academic papers, the collection of data from interviews, annual reports and documents collected from the case company.

Conclusion: The study adapts on the cybernetic controls part of the framework of Malmi and Brown (2008) elaborating the discussion to resolve the limitations of traditional accounting practices with the combination of modern accounting techniques. Since some conventional practices of accounting are no longer commensurate to the contemporary lean manufacturing environment, the emerging techniques comes in place. That is to eliminate ineffective practices and to make sure those modern accounting practices are relevant to support lean manufacturing. The proposed framework inspired by system thinking theory and value chain management, build a business model that prioritize customer first. The integrated management accounting system within the framework connects JIT+TC+TDABC+BSC together to build lean accounting in a package. The integrated management accounting techniques in a package shows the systematic way to capture the performance of value chain with the support of MCS. Resource utilization is optimized once the non-value added activities are eliminated and the performance of resources capacity increased.

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Abbreviation

ABC	= A ctivity B ased C osting
ACCA	= A ssociation of C hartered C ertified A ccountants
BASIS	= B angladesh A ssociation of S oftware and I nformation S ervices
BD	= B angladesh
BFC	= B usiness O bjects F inancial C onsolidation
BI	= B usiness I ntelligence
BPO	= B usiness P rocess O utourcing
BSC	= B alanced S corecard
CIMA	= C hartered I nstitute of M anagement A ccountants
COSO	= C ommittee O f S ponsoring O rganisations
CP	= C lient P rofitability
CR	= C orporate R esponsibility R eporting
CSR	= C orporate S ocial R eporting
DFD	= D esign F unction D evelopment
DKK	= D anish K roner
EDI	= E lectronic D ata I dentification
ERM	= E nterprise R esource M anagement
ERP	= E nterprise R esource P lanner
FTE	= F ull T ime E mployee
GAAP	= G enerally A ccepted A ccounting P riniples
GP	= G raphic P eople L imited
IC	= I nternal C ontrol
ICAEW	= I nstitute of C hartered A ccountants in E ngland and W ales
IFRS	= I nternational F inancial R eporting S tandards
ITES	= I nformation T echnology E nabled S ervices
JIT	= J ust I n T ime C osting
KC	= K aizen C osting
MAS	= M anagement A ccounting S ystem
MAC	= M anagement A ccounting C ontrol
MCS	= M anagement C ontrol S ystem
MNC	= M ultinational C ompany
NASDAQ	= N ational A ssociation of S ecurities D ealers A utomated Q uotations
PBIT	= P rofit B efore I nterest and T axes
P&L	= P rofit and L oss
PMS	= P erformance M anagement S ystem
R&D	= R esearch and D evelopments
SBU	= S trategic B usiness U nit
SOX	= S arbanes O xley A ct
SOP	= S tandard O perating P rocedures
SAP	= S ystems, A pplications and P roducts
SP	= S oftware P eople B angladesh L imited
TC	= T arget C osting
TD ABC	= T ime D riven A ctivity B ased C osting
TPS	= T oyota P roduction S ystem
TQM	= T otal Q uality M anagement
USA	= U nited S tates of A merica
USD	= U nited S tates D ollar
WPP	= W ire P lastic P roduct I ncorporation
Y&R	= Y oung and R ubicam

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1. Introduction

The first chapter of the thesis provides the fundamental knowledge of what the introductory content mainly presents. It starts with introducing the background and relevance of information described in the topic. Next, the problem discussion will be delivered, followed by the research purpose and questions. Further, our forecast about possible findings and a contribution of this paper will be denoted. Finally, the outline of the thesis will be described.

1.1 Background

In the present competitive world of globalization with the technological advancement, organizations operate in a very agile and efficient production process (Porter, 1980; Wiersema & Bowen, 2008). To survive, organizations are constantly deciding to use new methods and tools, which enables them to cope with uncertainty and upcoming developments (AlMaryani & Sadik, 2012). These changes have a strong influence on management accounting systems. Management accounting system is regarded as one of the most crucial management control mechanisms that can support organization's decision making and control process. In the changing business environment, its objective is to assist managers and influence their behavior in a way that can lead to new business strategies (Hutchinson, 2007), that makes it highly relevant for studying. Based on the appropriate strategies, an organization could reach its objectives and successfully compete in the market through effective decisions. Thereby, managers use relevant management accounting information to support themselves in planning, controlling, performance evaluation and especially making rational decisions in order to reduce costs, improve product quality and then achieve organization's long-run objectives, with application of some accounting methods in the field of strategic management accounting, such as value chain analysis, activity-based costing, benchmarking, balanced scorecard, etc. (AlMaryani & Sadik, 2012; Egbunike, Ogbodo & Onyali, 2014; Medeiros, Santana & Guimarães, 2017).

Since the structure of the business changes in response to the competing demands, operational effectiveness improves over time. The operational excellence derived from the implementation of emerging practices. The lean manufacturing emerges in practice led by Toyota, Sony, Motorola, General Motors and Ford (Porter, 1996; Kennedy & Brewer, 2006) to bring economy and simplify the process to satisfy the stakeholders in concern of the prioritizing customers first. Lean management was introduced by Ford Motors, USA however, the concept originally perfected by Taiichi Ohno in Toyota Production System (TPS) in Japan during the 1980s (Hutchinson & Liao, 2009). The lean accounting focuses on integrating a set of principles and management practices, such as total quality management, time-driven ABC, just-in-time and target costing, which aim to reduce cost in the value creation process through removal of waste and simplification of all manufacturing processes (Chen & Chung, 2002; Blackstone & Cox, 2005; Manzouri et al., 2014; Ramezani & Mahdloo, 2014; Medeiros, Santana & Guimarães, 2017). Further, it was seen that some of the recent academicians tried to combine several of modern accounting techniques to

increase value and optimize the resource waste capacity (Souissi & Ito, 2004; Monroy, Nasiri & Peláez, 2012; Medeiros, Santana & Guimarães, 2017), but none of them has tried to combine it as a package, making the latest accounting techniques closely coherent with operation process and collecting the empirical evidence from a company. Thus, the contribution of the paper is to suggest a package with the combination of the JIT, TD-ABC, TC, and BSC with the lean accounting, and then examine it in the operational process of a single case company.

In this regard, after the prudent conducting of a theoretical review of the latest accounting techniques, we will go through a case company, AdPeople A/S, to understand how management accounting techniques record the data through the value chain and contribute to optimum utilization of resources. Our endeavor in this paper is to justify the possibility to connect the modern developments of management accounting together into a package in the single case company context.

1.2 Problem Discussion

Even though management accounting has been developed to assure that activities of organizations would reflect their new strategies, there are still some shortcomings existed. The traditional management accounting system is not enough to provide relevant information to manage, control and is insufficient in the attainment of strategic objectives (Johnson & Kaplan, 1991; Hutchinson, 2007).

The reason is that the management accounting practices based on the traditional accounting system arguably lost its relevance. This situation is mainly due to the distorted overhead allocation (Cooper & Kaplan, 1988), disregarding non-financial or qualitative measures, lack of benchmarking with competitor's performance (Shank, 1996). Hierarchically dependent organizational structure leads the dataflow of accounting system heavily interdependent among the cross-functional departments (Kennedy & Brewer, 2006). Stressful workload to satisfy the compliances, rules, standards makes the accounting functions slow, inefficient and highly bureaucratic. Moreover, due to these inefficiencies, organizations tend to experience a significant decline in profitability (Romney & Steinbart, 2015). Besides, the compliances and rules based financial accounting system, based on statutory requirements prioritizing to safeguard the interest of shareholders and government is not enough to create value for customers. So, value for customers cannot be derived from the system that record and produce the information to encapsulate the data of entire value stream, from the source of initiation of activities to the end point of the transactions which intends to prioritize other stakeholders in the first place.

Moreover, organizations lag behind in competitiveness as managers may make decisions based on misleading information generated from traditional accounting, it will lead to take wrong strategies on productivity, resources utilization, profitable product mix, market and customer segmentation

(Kannaiah, 2015). As a result, marketing, R&D, production or operation managers adopt their own way of keeping records according to their requirements without depending on the accounting system (Romney and Steinbart, 2015). Nonetheless, a short-term focus of traditional accounting management puts more weight on exploitation avoiding the need for exploration (CIMA, 2011; Pisano, 2015). Such imbalances and disintegration would make the business less sustainable.

Therefore, as a result of the limitations of the traditional management accounting, there is an increasing expectation that management accounting systems should be innovative in design, flexible in operation, and should enable rapid organizational change in response to capricious environmental circumstances (Otley, 1994).

In addition, there is little empirical evidence that shows traditional management accounting system aligns with the lean strategy. Although the importance of the concept that management accounting and control practices should be changed to the one that is more relevant for a lean environment has been slowly noticed (Fullerton, Kennedy and Widener, 2013). Hence, adjusting the management accounting systems to link to lean accounting could have a significant impact on organization's success. Furthermore, management accounting systems are also supposed to capture profitability of the whole value chain in organizations, which can be related to strategic cost management, including value chain analysis, cost driver analysis, and competitive advantage analysis (Shank, 1996).

Thus, we believe that the framework and its cybernetic control, designed by the Malmi and Brown (2008), needs to be expanded and updated incorporating modern accounting techniques, in response to the current demand at the market. Then the possibility of combining the latest accounting techniques in a package may lead to increase the value through optimization of resources. Despite the fact, some recent academics have examined the combination of new accounting principles, none of them has created a framework by incorporating more than three techniques. This makes a challenge for our research (Clinton and Hsu, 1997; Souissi and Ito, 2004; Monroy, Nasiri and Peláez, 2012; Medeiros, Santana and Guimarães, 2017).

In summary, the limitation of traditional management accounting makes it interesting to investigate how the management accounting can be developed for companies to keep the pace with the changes and competition. In this regard, to regain the relevance, management accounting requires adopting best practices, implementing them as a package that can closely measure the performance of operations and manufacturing process in order to guide the marketing and production managers in an effective way to optimize the utilization of resources in any value-driven organizations.

1.3 Research Purpose and Question

The purpose of this paper is to search how the accounting techniques can support optimization of resources utilization leading to create value for the organization connecting contemporary management accounting techniques together in a package around cybernetic control. The secondary objective is to eliminate the shortcomings of traditional accounting using emerging methods of accounting. This has led to a more specific question as follows:

How the contemporary management accounting techniques can be combined in a package within cybernetic control in the best possible way for optimizing utilization of resources through the value chain?

1.4 The expected outcome

The paper aspires to come up with an innovative solution for customer value driven international organizations to prescribe the process of implementing lean accounting with increased engagement in the operational process. In this context, the study will diagnosis the limitations of conventional accounting then to make a relevant discussion of underlying construct of modern accounting developments. This is to know how those emerging techniques could be used to resolve the shortcomings of the traditional accounting. At the same time, the paper would search if those contemporary management accounting techniques can be combined in a package by developing a framework with the support of management control system. The pursuit of the study is to see whether the combination of the contemporary management accounting techniques can capture the activities and transactions of entire global value creation process within the value streams. Thereby, the aim is to empower the frontline staffs, management in optimizing the consumption of resources through a continuous improvement action plan supporting the lean management throughout the value chain.

1.5 Thesis Outline

The thesis outline provides an overview of the layout of the whole paper at a glance for the ease of navigation. The structure of remaining chapters is as follows:

Chapter two – Methodology. The methodology chapter will describe the methods based on which the research is conducted. It contains the framework of research design, selection of the case company and data collection.

Chapter three – Theoretical review. The aim of the theoretical review chapter is to explore the underlying construct of contemporary accounting techniques with a view to search the way to connect those modern methods in a package. This chapter starts with explaining the implication of

management accounting controls in the accounting system. Subsequently, the limitation of traditional accounting with regard to the lean philosophy will be discussed. Afterward, current accounting techniques such as JIT, TD-ABC, TC and BSC will be described in more detail, followed by a discussion of how these techniques can be connected in a package. The chapter will wrap up with the theoretical development of the framework.

Chapter four – Empirical Findings. The empirical findings chapter will cover the empirical analysis of a survey and the case company. A detail discussion will provide a preview about the company to make the application of a framework understandable in the case company context. In this chapter, the result of the application of designed framework will be justified by combining numerical analysis of data collected from the annual financial statements. Besides, the implication of cybernetic control and importance of integration and automation of financial system to support the linkage of accounting techniques will be described to demonstrate the way to use resources in optimum level.

Chapter five – Discussion. The discussion chapter covers the issues relates to the integration of contemporary management accounting techniques and the application of the integrated framework. The limitations and contribution will also be discussed at the end of this chapter.

Chapter six – Conclusion. The conclusion chapter will present the summary of the study and the further research scope.

2. Methodology

The methodology in the paper is divided into three parts: the research design, selection of the case company and the data collection including the literature review. The first chapter will provide the information about the research design framework, such as the case study approach, the nature of analysis, inductive reasoning that will help to understand better the descent of the research design. Finally, the background for the triangulation source of data collection will be explained in third part.

2.1 Research Design

The research design provides a framework for the collection and the analysis of data (Bryman & Bell, 2009). According to the purpose of the thesis, to analyze the management accounting techniques in the time driven and value chain context, and to construct the useful modern management accounting framework, the case study design is appropriately chosen for this thesis. The reason is that it allows to conduct a complex business research, by observing the nature of the case in a single organization. Bryman and Bell (2015) explained that a case study is a method which entails the analysis of a single case or a single organization. Yin (2003) suggests that a case study is an empirical inquiry that investigates phenomenon within its real-life context. The research is based on a single case study, following embedded design to present the quantitative analysis of data collected from surveys (Yin, 2004). Also, the case study is informed from a naturalistic interpretive perspective (Baxter & Chua, 2003). A naturalistic perspective means that the designed framework can be explored into the daily accounting management processes of the company that aims to increase their value. Thus, the case becomes a representative or typical case, which analyzes an everyday situation in an entity (Lee, Collier & Cullen, 2007; Bryman & Bell, 2015). The level of the analysis is focused on organizations, including both interviewing the personnel at the case company and fulfilling the survey that is created specifically to explore accounting management technologies that are applicable by the companies over the world and to define the common problems in accounting management as well as their solutions.

The research design has taken from mainly inductive reasoning. The inductive reasoning starts from searching the pattern from theoretical observation continuing to the research process leading to results from observations (Goddard & Melville, 2004; Bernard, 2011). Whereas, the deductive approach is used to guide the data collection leading to build a framework by analyzing the empirical data. Trochim (2006), Creswell and Plano Clark (2007), Soiferman (2010) and, Heit and Rotello (2010) refer to the two broad methods of reasoning as the inductive and deductive approaches which have presented in (**Appendix # 1**). Thus, the combination of inductive and deductive approaches may be considered as the most complex part of the case study, as it estimates both current academic development and the company's environment. As the qualitative research approach is undertaken, the theories are usually inductively arrived at from the data that are

collected (Bryman & Bell, 2015). However, qualitative researchers tend to prioritize logic emerging from experience, preferring to expand their knowledge from it as opposed to using a priori, deductive, concepts (Strauss & Corbin, 1998). Thereby, our effort in this paper is to avoid the quick heuristic process of qualitative research. We undertake a slower analytic process to come up with qualitative research method to frame more accurate theory.

2.2 Selection of the company

The case company is chosen according to the anticipation of the opportunity to learn (Stake, 1995; Lee, Collier and Cullen, 2007; Kazdin, 2011). Secondly, the purpose is to find an entity, which is international and has three different locations to compare the financial results. Also, the company has to implement similar modern techniques as a part of the continuous improvement process. Thirdly, the selection of the company is based on the choice of its turbulent operating environment. The turbulent environment is determined since the company is operating globally in highly competitive markets with frequent changes in business structure and ownership. Moreover, the company is running its business within the industry that can easily be threatened by technological changes. Another essential reason is that the case company existed with inter-organizational model of structure having a vertical integration with two other business units supplying information technology enabled services (ITES) within the value chain in the value streams. As the company manages with the policy and strategy of a big holding company, the aim is to purposefully select such a company, which would potentially provide a rich data resource for the study to know in what way the accounting system can create value through the value chain in a turbulent environment. Finally, our goal is to combine the learning possibility since the existence of the similar management control environment can ease the integration of theoretical learning in practice.

2.2.1 Ethnography Observation

The ethnographic approach implies intense research involvement in the daily running of the business operation so that researchers can understand processes and procedures from an insider's point of view (Bryman & Bell, 2015). The chosen case company is a privately-owned Danish company operating under the network of another Danish entity, which is also a subsidiary of a holding company in the USA. The case organization has the majority shareholding rights of two other companies in Bangladesh established in the joint venture arrangement. We conduct the micro-ethnography observation at the case company located in Denmark, focusing on management accounting practice for several months, elaborating the cybernetic control applying the theory in the value chain to deal with our research purpose.

2.3 Data collection

The chapter will provide information about our theoretical background and the research base in terms of the data collection. The data collection encompasses triangular sources, which according to Bryman and Bell (2015), entails using more than one method or source of data in the study of social phenomena. In this regard, we have chosen to collect data from multiple sources such as course literature, survey data and data collected from the case company' to make the ground of findings more reliable and valid.

Literature review follows inductive reasoning approach. Soiferman (2010) asserts that the literature review plays a major role in justifying the research and identifying the purpose of the study. The literature review is brief in scale by nature and does not usually follow the research questions to the same extent as literature reviews in quantitative research do. Thus, the selection of the academic papers is based upon the subjective choice out of cognitive mapping of contents of studies the Master Program at the Lund University. Thus, this study follows the articles in accounting and management control suitable to analyze whole aspects of the value chain of a manufacturing or a service oriented organization. While searching for the academic papers, the next cites are used in Google Scholar, Lund University Library. The keywords are lean accounting, limitations of traditional accounting, the underlying construct of contemporary management accounting, management control, strategic cost accounting, just in time, target costing, time-driven ABC, balanced scorecard, value chain management, strategy, the framework of Malmi and Brown (2008). Besides, the area of management accounting literature is proven with the results of our sampling based on survey questions, where management accounting professionals are asked to answer questions about traditional and modern accounting tools.

Survey data convey the research approach that analyzes the current practices of the traditional accounting as well as the application of the modern accounting techniques. The objective is to collect information in the search of direction for possible solutions from the professional perspective. Thus, in the survey questionnaires on "Management Accounting best techniques", modern techniques such as the application of the JIT, Target Costing, TDABC, Lean accounting are included (Moilanen, 2008; Kaplan and Anderson, 2013) (**Appendix # 2**). In this process, we used Google forms and survey monkey.com. to collect data which come up with the data collected from 20 respondents. The survey respondents consist of practitioners as the CFOs, Financial Managers and general managers from eleven countries and having variety of professional qualifications. The trend of survey data guides the approach for designing research approach in collection of empirical data from the case company.

The case company data. The findings of theoretical review in the conventional and contemporary accounting practices have been justified to understand the underlying construct of management accounting tools and techniques that are applicable to the case company and other firms in the daily life. The justification is made according to the following collected information. The

observations of the processes and procedures of the operation and accounting system of the case company conducted for 3 months long period visiting the site 3 days in a week from 10 a.m. to 5 p.m. Secondly, the collection of the multiple source of evidence, which includes the interviews during the informal settings and the document analysis. The interviews hold the duration from 15 till 30 minutes with the CEO, the CFO, the Finance Director and the IT director. Finally, the document analysis of the discussed company was used.

The design of interview. The semi-structured interviews were conducted referring to “a context in which the interviewer has a series of questions that are in the general form of an interview schedule but is able to vary the sequence of questions. The questions are frequently somewhat more general in their frame of reference where the interviewer usually has some latitude to ask the further question in response to what are seen as significant replies” (Bryman & Bell, 2011, p.205). The interviews were held with following people of case company. Interviews with Martin, Jose and Morten taped, however; Chris and Torben were not interested in formal recording but responded positively in informal settings.

Sl. No.	Name of interviewee		Date	Duration
01	Chris Mayer	CEO, AdPeople A/S, Denmark	28/04/2017	30 Minuts
02	Martin Saxthorpe	CFO Wunderman A/S, Denmark	10/05/2017	40 Minuts
03	Jose Luis Sanchez Luppi	Vice President of Global Operations & Production, Wunderman, USA	12/05/2017	37 Minuts
04	Torben Snowman	CFO, WPP Denmark	16/05/2017	38 Minuts
05	Morten Lindgren	Finance Director, AdPeople A/S, Denmark	16/05/2017	32 Minuts

Table 1: Interview information

The current interviewees consisted of CEO, CFO, financial director of case company, AdPeople A/S and Vice president and CFO of the mother company, Wunderman. The questionnaires were structured with the ability to investigate the research question in the case company and to develop the framework. The objective of taking interviews was to investigate deeper understanding of the current issues with the traditional accounting and the level of the application of modern accounting techniques. The participants were selected by the professional and hierarchical position within the case company for the individual interview and by the professional and hierarchical level in the random companies (Bryman & Bell, 2015).

Document analysis. The document analysis is described as a textual approach of the researcher's observation (Wolfe, Gephart & Johnson, 1993; Bryman & Bell, 2015). It includes the archival data that are designed by the case company, public transcripts, newspaper reports, government legal acts, etc. Besides, it consists also of self-generated text that is created during the interviewing or questionnaires data collecting. The interview transcripts with the CFOs and Financial Directors in the WPP and AdPeople companies become the personal documents that are used in the paper (Bloor, 2002). Thus, the complex documentational analysis is made to examine the research issue by using different sources of information.

2.4. Reliability and validity

Qualitative researchers have reacted for decades to the distorted view of the field (Strauss & Corbin, 1998). On the other hand, Bendassolli (2013) argues that an induction has been lauded as one of the main pillars of qualitative research methods. The problem of induction refers to the difficulties involved in the process of justifying experience-based scientific conclusions. He also criticizes such inductive thinking being problematic because a person can never assure that a recurring event will continue to occur. Bryman and Bell (2015) also criticize a qualitative research for being impressionistic and subjective, since qualitative findings rely too much on the unstructured nature of data and so, the interpretations are profoundly influenced by the subjective learnings of revisited grounds previously trodden by other researchers. Thus, the readers often pause with a question about the reasons why one area is chosen over another. Therefore, we prefer to take outsiders opinion, who are experts in the field of studies through the survey and several numbers of interviews, after the ground theoretical review is made.

Despite the fact, the survey responses were limited in numbers. The relevance and applicability of the framework depend upon the nature of business and organization's adaptability of a lean environment. The application of a framework that we have undertaken was indicative, as it took small scale dummy data following the work-flow of a service oriented company. Thus, due to the limited set of data and limitation of interviews conducted with several individuals, this study perhaps cannot be generalized before it is being tested in a real-life business.

3. Theoretical review

The theoretical review starts from the role of Accounting in Management Control System in the Malmi and Brown (2008) framework. The objective is to explore how contemporary accounting techniques can be connected in a package to reduce the information gaps so that managers can take effective decisions related to resource allocation, product mix, market segment and optimizing the overall performance of value chain. In this regard, our theoretical part is divided into four chapters. The first chapter is devoted to explaining the implication of management accounting controls in the accounting system. The second chapter includes the limitation of traditional accounting according to the lean philosophy. The third chapter explains current accounting techniques such as JIT, TD-ABC, TC, BSC in the time-driven and customer-oriented context. The fourth chapter discusses findings made by the recent academicians in combining the modern accounting techniques. The fifth chapter presents a theoretical discussion about our framework development.

3.1 Accounting in Management Control System

The history of the accounting as a double entry booking system was started from the Pacioli L more than five hundred years ago (Johnson and Kaplan, 1991). Further, the role of the administrative control became highly important during the time of the first bank transactions. The managerial control got its worldwide attention with the globalization process, afterwards in the year 2008, when Malmi and Brown conducted one of the most popular researches in the traditional accounting and created their framework (Picture 4). The framework of Malmi and Brown (2008) is divided into the three control areas that are cultural, cybernetic and administrative. Also, it possesses the planning phase and the reward and compensation part.

Cultural Controls						
Clans		Values			Symbols	
Planning		Cybernetic Controls				Reward and Compensation
Long range planning	Action planning	Budget	Financial Measurement Systems	Non Financial Measurement Systems	Hybrid Measurement Systems	
Administrative Controls						
Governance Structure		Organisation Structure			Policies and Procedures	

Figure 1: Management control systems package

Source: Malmi and Brown (2008)

The cybernetic control will be considered, to make our discussion focused on the topic of the paper, as this control includes budgets, financial measurement system, non-financial measurement system and hybrid measurement system. Thus, it gives an impression that the cybernetic controls incorporate the management accounting system. However, we presume the whole framework of MCS including cultural controls, planning, cybernetic controls, administrative controls, reward and compensation are the integral parts of the accounting system. From another point of view, an accounting system is the most important part of MCS as it supports the various controls, planning, reward, and compensation schemes. Accounting, as an integral part of management control systems (MCSs), enables control as it makes it possible to maintain discipline, to control and to act at a distance in value chain management for organization operates globally (Robson, 1992; Moilanen, 2008; Quattrone & Hopper, 2001). Even though the management control includes a broad spectrum of mechanisms and practices besides accounting, management accounting constitutes an integral part of management control systems (Moilanen, 2008).

Finally, it is essential that the accounting system resides within the cover of MCS. Although, management control system cannot be relevant or effective if cybernetic control, i.e. accounting system does not adapt to the change of manufacturing process (Clinton and Hsu, 1997). Therefore, before discussing in what way the cybernetic control can be developed, the following chapter will diagnosis the major difficulties of traditional accounting system in dealing with change and competitions at this time.

3.2 Limitations of traditional management accounting

Due to some of the shortcomings, the traditional management accounting system is not enough to adapt to the changes in the intense competition and is not appropriate for today's environment, especially when it operates in the lean environment (Maskell and Kennedy, 2007). According to Hutchinson and Liao (2009), Kaplan and Anderson (2013), Kennedy and Brewer (2006), Maskell and Kennedy (2007), Romney and Steinbart (2015), these shortcomings can be synthesized as below:

Distorted overhead allocation. The traditional accounting mainly allocates fixed production overhead based on labour hours, even though automation, installation of state-of-the-art equipment has drastically reduced the amount of direct labour used to manufacture a product (Romney and Steinbart, 2015). Thereby, in the technology-driven, machinery and equipment intensive organization, allocation of overhead based on labour our rate is no longer justified (Kaplan and Anderson, 2013). The illustration below shows in what way the cost flows to balance sheet and income statement. If the product cost is not correct, then the valuation of inventory and cost of goods sold will remain incorrect. The distorted overhead cost can put adverse effect on competitive advantage as a wrong product cost can hamper the market segments or customer segments.

Wrong product costs. Traditional accounting systems use standard cost to calculate product costs (Maskell and Kennedy, 2007). It completely ignores non-manufacturing costs or period costs, and the costs are estimated based on the historical cost that has already been incurred. That is why, standard product costs can be misleading when making decisions that are related to profitability, make or buy, sourcing, product mix, customer priority, etc. Standard cost designed during the 1900s no longer reflects economic reality (Kaplan and Anderson, 2013).

Inventory buffer. Traditional accounting suggests to produce large batch to minimize non-value-added changeover time, to decrease machine downtime and to have fewer material movers, which in turn create high inventory levels to retain a buffer stock for a demand uncertainty in the supply chain. In reality, a large production batch increases storage costs and needlessly occupies floor spaces (Hutchinson and Liao, 2009). The inventory can be considered as sunk cost as it consumes cash that could be invested elsewhere. Besides, the inventory is vulnerable to spoilage and become obsolescence costs (Kennedy and Brewer, 2006).

Production in large batch. The traditional production system is based on the sales forecast that follows the push approach that transfers a raw material through the conversion system so that the product would be ready to transport when the customer order arrives. Despite the fact that the sales target is determined, based on the thoughtful scientific estimation of the customer behaviour, Kennedy and Brewer (2006) believe there is a risk of the stock outs and a markdown (i.e. the increased amount of stock due to the incorrect forecast).

Disconnected departments. Traditional accounting is based on the belief that similar clustering machinery and functionally trained employees in disconnected departments creates efficiencies (Kennedy and Brewer, 2006). In fact, this belief creates bureaucracy, interdependencies and goal incongruence where long-term strategy, speed, and competitive advantage is undermined over departmental targets.

Bureaucratic management control. Kennedy and Brewer (2006) explain traditional management control influences mechanistic culture through a strong supervision of a line worker. Also, influencing factor becomes the adversarial short term relationships with suppliers to lower the cost of purchase. Moreover, a conventional focus applies to increase revenue enforcing budgetary target. However, managers ignore the associated risk of the increased overhead cost for the rework and the scrap of machine downtime due to the late delivery of raw materials, leading to the lower quality and the decline of the profit even if the revenue is increased. This control system makes process and procedures less flexible and leads to the waste increases in the companies.

Stakeholder salience. Romney and Steinbart (2015) argue that traditional accounting is more focused at the shareholders and governmental agencies as it regulates the financial accounting data, which is based on the standards and compliances such as IFRS, GAAP, SOX Act, Companies

Act, taxation laws and regulation. Whereas the value is driven by customers at first, further by the employee and suppliers in the profit-oriented organizations. The explanation is based on a case study by Kennedy and Brewer (2006) who agree that process and activities are labeled as a value-added or non-value-added based on their contribution to a customer value.

Less priority to frontline staffs. According to Kennedy and Brewer (2006), a profit maximization is usually made by reducing expenses mainly connected with the labour cost. Whereas the front-line employees have become important capital assets, who create value by applying their skills and experience to generate a profit, their dissatisfaction can cause a risk of a decrease in revenue.

Quality improvements. Cost accounting system does not provide a measure to quantify the effect of quality improvements that have occurred as a performance report focused primarily on financial measures. Romney and Steinbart (2015) state that the front-line employees, line managers, and non-financial people need more accurate and timely information on physical activities, such as units produced, defects rates and production time. Thus, it reveals quantitative results, however not the qualitative indicators of performances.

Competitor's performance analysis. The world-class organizations have a goal to improve the actual performance at a faster rate than competitor's, but a traditional accounting only compares the internal performance.

The proponent of contemporary accounting also finds the following shortcomings of traditional accounting:

Less engagement with operations or manufacturing process, personnel and functions;

It covers just the internal value chain when a cost optimization through value chain reconfiguration remains within the scope of a supply chain from supplier's side as well as in distribution channels in customer side;

A significant workload on financial and operational employee requires a great number of non-value added activities to be performed by accountants.

To conclude, Richard and Oliver (2008) and Romney and Steinbart (2015) state in case a company's cost accounting system becomes inadequate, a company should look around to search for what is available.

3.3 Emerging practices of management accounting

One of the proponents of new management accounting was Shank (1996), who argues that the strategic cost management perspective includes three key themes, taken from a strategic management literature: (1) value chain analysis (2) Cost driver analysis (3) competitive advantage analysis. These three themes are addressed with the contemporary management accounting techniques, such as constructing a lean accounting system, JIT, TC, TD-ABC and BSC models. In the chapter, we shall navigate the potential capability of the MAC modern approaches, whether it can fulfill the strategic needs of business in light of the literature review by focusing on the cybernetic control elements.

3.3.1 Lean accounting

As the market globalization and advancement of technologies in production and operations intensify over time, new approaches (i.e. lean manufacturing, total quality management (TQM), just in time (JIT), six sigma, kaizen and target costing models) deal with continuous improvement of complex operational effectiveness in order to cope up with competitiveness (Ofileanu, 2015). While the manufacturing process is upgraded, the traditional accounting based on increased compliance control pulls the operational progress behind, which seems to be a hindrance in competitiveness. Thus, management accounting needs to keep pace with the progress of manufacturing process to encapsulate the dimensions of process, activities and resources; otherwise, the accounting control will be abandoned as external production control playing no role in operations (Johnson, 2006b). Nave (2002) points out that the good management means focusing on the system, not achieving targets. According to Johnson (2006b), accounting comes out of the mechanistic model of wealth maximization by analyzing interdependent parts that are assembled by external design and altered only by external force or outside intervention, rather than managing process inspired by system thinking with the philosophy that interdependent parts are self-organized into a coherent whole that is greater than the sum of parts (Ackoff, 1994). Operational effectiveness and cost variables can be managed by designing the system properly and letting results happen. The lean model is the living system that connects the concepts to live in harmony with sustainability to ensure possibilities that all life on earth will flourish indefinitely. A company ensures the possible lowest operating costs when it conducts its operations sustainably. According to Hutchinson and Liao (2009), Kennedy and Brewer (2006) and, Monroy, Nasiri and Peláez (2012), lean principles are outlined below.

The key to lean is the customer-driven value, with the lean entire value chain revolve around delivering customer value. Customer order trigger production in the lean environment, thus purchase orders and inventory storage react and schedule work orders according to the requirement of customer orders. This indicates the implication of Just in Time approach (Hutchinson & Liao, 2009).

Resources are aligned around value stream to deliver product and services to customer justifying the value for money with superior quality, feel and functionality. The example is the research of the logistics design in the Italian industry (Filippini & Forza, 2016), where it is noted that lean accounting is applicable for both manufacturing and service companies.

The lean concept is a philosophy where non-value-adding activities are being recognized and eliminated in lean manufacturing systems (Monroy, Nasiri & Peláez, 2012).

The lean undertakes cellular approach by employing production planning, value stream teams are dedicated to mirroring the improvement of flow in each process (cell) from customer order to customer transportation.

In lean, continuous improvement means a reduction of delay focusing on 'time' that reduces waiting time, shortens total production time, decreases customer delivery time. The time is controlled monitoring the unused capacity converting time saving as being reduction of costs. This implies the importance of implementing Time Driven - Activity Based Costing (Hutchinson & Liao, 2009).

Fully complies with GAAP with its controls and reporting rules. Chavez and Mokudai (2016, p.22) and Wahdiat (2016) examine about the lean accounting reporting in their researches, stating that "LA reporting totally complies the GAAP rules".

Lean Accounting must strengthen internal accounting control. This principle is based on process maps showing controls required in improvements of the process to decrease the SOX risks (Maskell & Baggaley, 2006).

Measures motivate and maximize the benefits of lean continuous improvement. This measurement process can be installed with Balanced Scorecard (BSC), by estimating the four perspectives of the company's concerns such as financial, customer, learning and growth, and internal perspectives (Giannopoulos et al., 2013; Kaplan & Norton, 2005).

Empowering entire workforce by training and letting them place opinion, collaborate with each other and decide on quality related issues. Lean establish long-term relationship with a limited number of suppliers and strengthen collaborating in value stream (Hutchinson & Liao, 2009).

Clearly and timely communicated information that is understandable and transmitted to the appropriate person.

Monroy, Nasiri and Peláez (2012, p.13) describe as "control of production processes is done by visual performance measurement tools and box score and value stream performance board also

supports continued improvement”. Box score presents the operational performance and the financial performance in one sheet (Maskell and Baggaley, 2006). The tool is also widely used for decision-making purposes. So that, the more complex data is provided, the better decisions, leading to better revenue and profits can be generated.

JIT, TC, TD-ABC, BSC, capacity analysis, value stream maps and box scores are tools that support these principles mentioned above.

Further, Kennedy and Brewer (2006) observe in the case study that lean accounting can be broken down into four parts, such as (1) financial reporting (2) product costing (3) performance measure (4) elimination of non-value added process and activities. Firstly, in financial reporting, it produces income statement by value stream. Secondly, Maskell and Baggaley (2004) confirmed that the lean product costing avoids arbitrary allocation of overhead and product and service price is determined by customer’s approval which is based upon pricing matrix that tailors product costs based on product features and functionality. Thirdly, Hutchinson and Liao (2009) also state the performance measures incorporate those qualitative and non-financial indicators on top of financial ones. The objective is to empower front-line workforce, monitor customer, attain employee satisfaction, benchmark with competitor’s performance, improve process, cost and quality focusing strategic priority. Non-financial measures link its organizational goals with its value streams. Fourthly, the elimination of non-value added activities could be attained through outsourcing, vertical integration, improvement of integration and automation. While manufacturing floor achieves dramatic improvement in ‘inventory turnover days’, accounting department still looks for possibilities to optimise accounts payable and payment activities (Monroy, Nasiri and Peláez, 2012). This can be done by receiving material with bar-code scanning machine, reducing process time of purchase order approval, three-way matching of purchase orders, transfer of work-in-process and finished inventory to warehouse, formalities for material receiving reports, invoice approvals and implementing automated payment to suppliers upon receipt of material and quality inspection (Monroy, Nasiri and Peláez, 2012).

From the above discussion our mental map based on the previous studies hints that the target costing, just in time manufacturing, time-driven ABC, balanced scorecard characteristics fit in line with the principles and objectives of lean accounting at the same time cover all the elements of cybernetic control. Next chapters will look around in justifying this hypothesis.

3.3.2 Just In Time (JIT)

The Just in Time concept possess a vital role for any company that would like to reduce their production wastes, strength the position in the market and improve the quality of the product (Kannan and Tan, 2005). The JIT production principles were developed in Japan by the Toyota Motor Company in the early 1970s (Rama and Holl, 2017). The lack of natural resources had a negative impact on the cost of raw materials as the raw materials were imported from other countries, it made prices of Japanese product higher and thus more competitive at the market (Shah and Ward, 2007). The management of JIT is based on two principles (1) elimination of wastes and (2) respect for people, but it is more important to ensure full utilization of the capabilities of people (Davy et al., 1992). However, there is a more complex definition assigned by Hall (1983, p. 231) as “the elimination of waste in all areas of the manufacturing firm”. This definition is supported by Hernandez (1989), Stonebraker and Leong (1994), Kannan and Tan (2005) and, Bookbinder and Dilts (2016). The areas for waste elimination are presented below:

- Wastes in the production line;
- Wastes in the materials department;
- Wastes involving suppliers and customers;
- Wastes in design engineering;
- Wastes from waiting or delay;
- Wastes from transportation;
- Wastes from defective parts.

To summarize, JIT principles enables companies to operate effectively with a limited number of resources, lead time transportation, improving the quality and solving the problems as soon as they appear (Bookbinder and Dilts, 2016; Hernandez, 1989; Krajewski, Ritzman & Malhotra, 1999; Lee, 1990; Schniederjans, 1993). The major benefits of the JIT principles in manufacturing industry are summarized by Chase, Aquilano and Jacobs (1998) and, Canel, Rosen and Anderson (2000) which are as follows:

- Reduction in raw material usage, work-in-process and finished goods inventory level;
- Improved level of product quality;
- Increased flexibility and ability to meet customers’ demand;
- Reduced overall manufacturing costs.

The main strategy is to eliminate waiting time through the production process after which investments in the inventory level can be minimized, production times can be decreased, changes in demand can be quickly addressed, and quality problems can be solved (Canel, Rosen & Anderson, 2000).

The service industry is considered to operate similarly with the manufacturing that implies the service industry could also get benefits from implementation of the JIT principles. Levit (1972) states that JIT concept can be applicable for both manufacturing and service industries, despite the final outcome. The majority of authors analyzes the JIT implementation in service in their case studies. Fitzsimmons and Sullivan (1982) describe how to shift the process from the product orientation to the client orientation. The concept is supported by Filippini and Forza (2016) and, Vonderembse, White and Ardalan (1996), who agree that simplification of a product process, decrease in the amount of inventory from suppliers and rise in the quality of the service will lead a company to the success in the highly competitive market.

Silvestro et al. (1992) and Bookbinder and Dilts (2016) distinguish the JIT implications in service companies according to 1) the focus on people, when the delivery channels are primarily designed with the employees involvement or through the equipment and machines, when the role of technology plays a critical success factor (CSF), 2) to determine the amount of time per transaction, so how much time the customer spends for one transaction, 3) the degree of customization, 4) the discretion amount per customer that is provided as after sales service to improve the result, 5) the proportional amount of customer and clients collaboration, the number of frontline staff contact to the total amount of employees, 6) the focus on production and process, the shift from the product type, characteristics, quality, etc. to the marketing, design and delivery processes.

The common characteristics of JIT principles applicable for the service industry are developed by Benson (1986) and expanded by the current authors such as Canel, Rosen, and Anderson (2000), Monden (2011) and Filippini & Forza (2016): Their findings synthesized as below:

Total visibility. The tendency of the customers' attention shifting from the final product to the operation process is evident in the service industry (Canel, Rosen & Anderson, 2000). Providing an intangible product, the customer evaluates not only its characteristics and the result (i.e. a program from the IT company), but also the marketing part (i.e. waiting time, communication with the salesperson, a reputation of the enterprise). The delivery process (i.e., the length of service provision, the delivery channels) and the discretion operations (if the company is ready to remake or change the service result in the case of a customer's dissatisfaction) are also taken into consideration. By having no possibility to touch, see and feel the product, the customer evaluates the competitiveness of the company to other providers justifying the service provision process.

Synchronization and balance. As the service delivery enhanced on the single type of production or maintaining the system (i.e., programming, restaurant service), it is important to match the customers' orders with the current possibilities of business. Thus, the supply and the demand have to be matched effectively for the producer. As a result, scheduling and planning became vital for a company.

Respect for people. Company's staff such as administrators and sales person come to the first contact with the clients. By supporting the constant communication with customers, the employees acquire valuable knowledge about the demand and customers' preferences (Albrecht & Zemke, 1985). By allowing the participation of employees in the company's decision making process, the entity could get the additional beneficial information from the external market (Prajogo & Hong, 2008; Monden, 2011;).

Flexibility. Despite the process of standardization and simplification to decrease wastes, a company must correspond to the actual demand for high-quality products. That is made to stay flexible in their nature, to respond the changes and to react effectively to the current request at the market. The vision how to stay flexible and minimize its wastes was suggested by Allen, Stewart, and Robinson (2001), using a minimum viable product concept (MVP), which has further been developed by the Blank in the year 2013. The core idea is that the final product or service should possess maximum viable and few features (i.e., correspond to few number of tasks). If the service has maximum viable and many features, the release becomes longer, the feedback cycle will be increased and the larger investments will be necessary.

Continuous improvement. The development is important to maintain the market share and to expand. The ability to provide training for employees, which will influence of the impression and a reputation to the customer (i.e., salesperson, secretary, administrator), also including the quality improvements by the training to the professionals (i.e., designers, programmers, managers) will get advantages from the customer's point of view. The service industry may able to improve by the varying staffing, scheduling and developing the quality of service.

Responsibility for an environment. The environmental awareness may also exist in the company, as wastes decrease due to the reduction of resources usage (Monden, 2011). A good practical example is Turkish Airlines, which saved 86,916 ton of CO₂ by the end of 2014. "Our target is to reduce fuel consumption-liter/available ton-km by 5% by 2020 and 10% by 2025" (Turkish Airlines, 2015). The sustainability strategy became the attractive point and a powerful marketing tool for many successful companies such as Nissan, Microsoft, KPMG, British Airways (Heeres et al., 2011; Nissan Annual Report, 2015; KPMG Sustainability 2016; Microsoft Sustainable Policy 2016).

Simplicity. The lack of homogeneous production process makes it difficult to evaluate the performance and to optimize the performance, that's why there should be a common basis for the customer. The good example of which could be a Qlik's provision of the service. By using the agile methodology, they divide their services into small assignments, whereas each team provides only their part of the assignment and at the last stage, the parts are combined (Qlik.com, 2017). It will make the company focus their attention on the improving the specific areas in the service's lifecycle.

Holistic approach. The development process has a vital importance for the service companies both in the quality of services and its simplification/standardization. Further, marketing and communication parts need to be considered. To attain the simplification, the employees have to understand the service requirements of customers and the strategy as a whole. The current research is made by Prajogo and Hong (2008), where they discover that higher performing firms have a stronger strategy and operational relationships, than the lower performing competitors.

To summarize, it can be stated that just in time technique can be used not only in the manufacturing area but also by the companies that provide a service to the customers. The simplification of process and reduction of costs play a vital role in the process that will be described in the further target costing chapter. Finally, by applying the JIT service principles developed by the current research findings, it might be foreseen that JIT application will become widespread both at the multinational companies such as Microsoft, Nissan, Qlick and at the small local ones.

3.3.3 Target Costing (TC)

Target costing is an important part of lean accounting to drive value for customers. Target costing concept, as an efficient method for cost reduction, was developed by Japan's manufacturing industry in the early 1970s, due to the intense competition from the lean enterprise and the pressure from customers, which required more diversified products and shorter product life circles. Therefore, companies need to use it as a cost management tool to manage costs during the product development and planning stages (CIMA, 2005).

However, target costing is not solely about cost management. Sani and Allahverdizadeh (2012) regard target costing process as a system of profit planning and cost management, and state that target costing is a price-led, customer-oriented, design-focused, cross-functional process, and begins the concept of which lays with quality, functionality, and price. Besides, target costing with an aim to create value for customers and maximize profitability rather than reduce cost can be achieved with a clear analysis of customer, market and competitor information, with a great cross-functional team (Cooper & Chew, 1996; Cooper & Slagmulder, 1999, Fayard et al., 2014).

According to Cooper and Slagmulder (1999), it is important for companies to develop products and guarantee profits simultaneously. Thereby, target costing is a process for ensuring that a product can be produced at its life-cycle cost that can achieve profit margin at its expected selling price, without reducing quality or functionality. It is also a process of managing a company's future profits. As presented in the work of Cooper and Slagmulder (1999), target costing can be divided into three elements: market-driven costing, product-level target costing and component-level target costing. The first element is customer-oriented, which focuses on the usage of the allowable cost concept to transfer the competitive pressure from the marketplace to the company's product designers and suppliers (Bock & Pütz, 2017). Next, in the product-level target costing process, the

aim of product designers is to find ways to develop products for meeting customer requirements at the allowable cost without reducing quality and functionality. Once a product's target costing is established, the company develops target costs for the product's components (Hamood, 2016). Component-level target costing is regarded as a process that transmits the competitive cost pressure to its suppliers. The implementation of supplier management through selecting vendors and rewarding creativity is crucial in this element.

Thus, the main concept of target costing is simple, which can be calculated with target selling price minus target profit margin (Cooper & Slagmulder, 1999; Dimi & Simona, 2014), the process of target costing is complex and need to be described in details. According to Ax, Greve, and Nilsson (2008), there are seven steps in the process of target costing. They are the following:

Identifying the desired product and service characteristics. Target costing is a customer-oriented and market-driven approach. In the planning phase, considering company customer demands and product that will meet these requirements are important (Sani & Allahverdizadeh, 2012). This can be achieved based on the relevant market information, including market assessments, customer interviews, focus interviews and groups, prototype tests and competitor analysis (Cooper & Slagmulder, 1999).

Establishing target price. The product target selling price is set based on the relevant information (Karimi & Jafari, 2014). In this phase, the company should take some factors into accounts, such as the company's long-term sales and profit objectives, structure of product line, customer's perceived value, estimation of expected sales volume, length of product life cycle, the product's quality and functionality compared to competitive offerings, and price levels (Cooper & Slagmulder, 1999).

Determining target profit. It is important to establish the target profit that the company shall earn to ensure the achievement of its long-term profit plan. According to Karimi and Jafari (2014), it can be determined from profit levels for similar products, the actual profit for predecessor products, the target profit of the entire profit line.

Determining target cost. The allowable cost can be obtained by deducting target profit from target price. The target cost is estimated by adjusting the allowable cost for current cost reduction objectives, and for current cost factors. In this phase, conflicting objectives among cost, quality, and functionality should be balanced before the final target cost is set (Bock & Pütz, 2017). The quality function deployment(QFD) may be considered as a useful tool to help execute this step.

Target costing decomposition. This phase aims to break down target cost to allocate cost targets internally and to suppliers (Jiang & Hansen, 2016). There are two main allocation methods for this step, that is, function-oriented method and the component allocation method. In the function-

oriented method, the target cost is first allocated to the different functions of the future product and then assigned to its parts. When using a component allocation method, the target cost is allocated to subassemblies, components, and parts (Dimi & Simona, 2014).

Closing the cost gap. This step requires to recovering the cost difference. With the overall objective, it aims to optimize the relationships between different process, balance conflicting objectives and identify ways to enhance existing methods and processes (Dimi & Simona, 2014). This phase requires the anticipation of cross-functional teams and can be achieved with the help of several engineering techniques, such as value engineering, design for manufacture and assembly, and quality function deployment.

Continuous improvement. After a product has been introduced, efforts must be made in order to continually reduces costs and improve quality throughout the product lifecycle.

Since some techniques can help to accomplish every step of the target costing process, target costing is more similar to an overall framework within a range of different cost management techniques that are used to achieve target costs and to gain a profit (CIMA, 2005). The main techniques that can relate to the target costing will be presented below.

As far as, the target costing is linked to the value engineering, the value engineering is a technique to evaluate a product's design, and it aims to design a product to create possibly the best functionality at a given cost (Cooper & Slagmulder, 1999; Everaert & Swenson, 2014; Bock & Pütz, 2017).The value engineering technique was developed by Ibusuki and Kaminski (2007) and supported by Everaert and Swenson (2014) by considering all of the product's elements, and it can be divided into three steps:

The concept-VE;

The project-VE;

The validation-VE.

First, concept-VE focuses on the conceptual stage of product development and its objective is to increase the chance of developing revolutionary products with innovation search. Next, project-VE concentrates on the product and process design stage. Its purpose is to improve the product's function with a work plan. The work plan is one of the core methods of value engineering, which includes six parts: preparatory, information, analytic, creative, judgment and planning. Finally, validation-VE focuses on the product and process validation stage, and its objective is to create more value and functionality for the existing components through the improvement of the production process.

The Quality function deployment is used in the product concept stage of target costing process. The QFD provides a tool to ensure that customer's requirements have been translated into features of a product or a service without a compromise during the design and the development process (Cooper & Slagmulder, 1999; Jiang & Hansen, 2016). It begins with defining quality as meeting

customer requirements. Secondly, it puts product quality into practice through Principle of Deployment. Thirdly, it is attaching a numeric value to the qualitative of importance to different customer requirements. Finally, it uses a matrix to discriminate the unimportant requirements from the important ones (Sivaloganathan, Andrews & Shahin, 2001).

To summarize, target costing can be used for profit planning and cost management within a range of different cost management techniques such as value engineering and quality function deployment. It starts from defining the competitive selling prices based on the relevant information, then the target profit and allowance costing can be achieved in association with this target price. In the process of implementing, cross-functional teams within the organization are involved in, including design, production, and finance team, in order to close the cost gap (Jeacle, 2007).

3.3.4 Time-driven activity-based costing (TD-ABC)

To examine the TD-ABC, it is necessary to be aware of costs allocation in a traditional accounting system. The traditional cost accounting system uses the direct labor and machine hours, to allocate the expenses for indirect and support activities to products (Cooper & Kaplan, 1991; Kaplan & Anderson, 2013). Thus, resources are not necessarily consumed only at the unit level but also may be used at the batch level, the product sustaining level and at the facility sustaining level activities, which can constitute a large portion of product costs. Due to the distorted and less reliable allocation of indirect expenses, so called ‘fixed production overhead’, in the proportion of a labor rate or machine-hour, activity-based costing (ABC) emerged in the mid-1980s by conducting several Harvard Business School cases and articles to facilitate better business decisions based on more reliable cost information. However, according to Johnson (2006b), ABC method is a good answer for a poor question, since the ABC ignored the roots of problems’ causes related to the allocation of the overhead cost, making a cost accounting system unnecessary to the design and influenced by the separate piece-part thinking. The scientist argues that it is of particular importance to organize work at the lowest cost by optimizing the whole system with a radical program to eliminate overhead activities, then designing a better system to cost products or services and recommends shifting toward lean accounting philosophy. Even though, ABC has gained some attention by its practitioners since this model has facilitated managers identifying high cost, inefficient processes and the unprofitable products and customers, which have helped some small and mid-sized entities with the dramatic profit improvements (Kaplan & Anderson, 2013). Norton and Kaplan have acknowledged the limitation of ABC approach, based on the experience with issues related to scalability, time-consuming, costly, inconsistent application of cost to the large numbers of cost drivers and storage burden at computer application in enterprise level. Kaplan and Anderson (2013) have come up with an alternative approach that is Time-driven activity-based costing (TD-ABC) model, the idea of the TD-ABC framework started in 1997. Monroy, Nasiri, and Peláez (2012) define TD-ABC as this method identifies the capacity of each department or process and allocates the cost of this capacity of resource groups over the cost object based on the time required to perform an activity.

The essence of activity based costing is the management of the organization's capacity (Kaplan & Anderson, 2013). According to Kaplan and Anderson (2013), TD-ABC eliminates the requirement of interviewing and surveying for allocating resource cost to activities. Whereas the framework of TD-ABC involves an estimation of resources consumed by different groups as the 'unit cost' per units, and 'unit time' in minutes that estimated the time required to perform a transactional activity. According to Everaert and Bruggeman (2007), Monroy, Nasiri, and Peláez (2012) and, Kaplan and Anderson (2013), the steps of applying TD-ABC synthesized as follows:

To identify the various resource groups allocated to different departments or product line. The example of which are direct materials, direct staff costs, support staff costs, office rent, depreciation of property, personnel, supervision, occupancy, equipment and technology, etc.

To calculate the total cost of supplying resource capacity to each process, product line or department. It involves the TD-ABC model to calculate the cost of all the resources such as personnel, supervision, occupancy, equipment and technology supplied by this department or process (Kaplan & Anderson, 2013). The basic cost accounting formula for calculating resource cost is resource cost (C) equal to the quantity of resource units (Q) multiplied by the price per unit of the resource (P) i.e.; $C = (Q \times P)$ (Kaplan, 2014).

At the time of cost estimation, the resource cost can be taken from the budget. However, these costs are recorded in the chart of accounts or general ledger in the financial system if the TD-ABC needs to calculate product profitability or customer profitability at actual. The total cost can be summarized as groups of fixed or variable costs (Everaert & Bruggeman, 2007).

To determine the list of activities in performing orders or producing products by each of departments or processes (Monroy, Nasiri & Peláez, 2012). The examples are order handlings, quality checks, credit checks, shipping and delivery consignments, invoices.

To estimate an actual consumption process time or practical capacity time principally in minutes or hours per transaction on a cost object (Kaplan & Anderson, 2013). In the service industry, the workload of professionals, such as programmer or designer et cetera, can be estimated using Burndown chart, where it describes in what way the workload is estimated in terms of time framework (Wagenaar, Overbeek & Helms, 2017). The project management software such as workbook, JIRA or Team Foundation Server (TFS) can be used in estimating and recording process time adopting the agile methodology. These softwares are designed in a way that visualize the time consumed in different activities at the charts that interactively inform the changes of performance status and numbers of completed activities within the process.

To determine the capacity of the cost rates, per minutes. That can be calculated by applying the formula as follows: the capacity cost rate (unit cost) equals the total cost of the capacity of resources supplied divided by the practical or actual capacity of the resource supplied (Monroy, Nasiri & Peláez, 2012).

To ascertain cost driver quantities of activities for each cost objects (i.e. the number of orders, the number of sqm, etc). The justification is that the cost driver represents the consumption of activities on the different cost objects (Hoozée & Bruggeman, 2010).

To allocate resources costs directly to the cost objects (products, orders, customers, contract, job). The TD-ABC model assigns resource cost directly to the cost objects.

To ascertain estimated process time, where resource capacity in time is required, principally in minutes or hours per one transaction or cost objects. It can be made by the forecasting and the analytical estimation of the average time that is spent to conduct the activity.

To calculate used capacity that is actual consumption of resources as per TD -ABC.

To calculate the unused capacity of resources. That can be ascertained by using the following formula: the total capacity supplied minus the used actual capacity of resources (Kaplan & Anderson, 2013).

Further, let's discuss the benefits that organization can gain from implementing the TD- ABC (Kaplan & Anderson, 2013):

- Accurate allocation of fixed production overhead;
- Accurate product costing;
- Calculate capacity utilization of process;
- Contributes to lowering operation costs;
- Contributes to process improvement initiative;
- Calculate the profitability of order, process, and customers;
- Rationalize product mix decision.

To summarize, the TD-ABC framework can be applied successfully in case an organization can avoid the distorted overhead allocation and the arbitrary, subjective product costing based on the traditional standard costing. Probably, that is the reason why the TD-ABC and the ABC became the most popular alternatives to the traditional costing system (Hutchinson & Liao, 2009).

3.3.5 The balanced scorecard (BSC)

The balanced scorecard is a significant tool to support the implementation of management functions, such as planning, organizing, actuating and controlling (Wahdiat, 2016). The balanced scorecard in this thesis is used as a foundation for structuring the performance measurement system and for defining appropriate key performance indicators in the development of the theoretical framework.

The balanced scorecard concept was introduced by Robert Kaplan and David Norton in the early 1990's, based on the analysis of the successful experience of performance measurement system in companies. According to Kaplan and Norton (1996a), the balanced scorecard is a strategy management system that is used as an instrument to measure the organization's performance. Its objectives and evaluation indicators are derived from corporate strategy. The framework measures an organization's performance based on four different perspectives i.e. the financial perspective, the customer perspective, the internal business process perspective and the learning and growth perspective (Kaplan & Norton, 1996a; Giannopoulos et al., 2013; Wahdiat, 2016). Thereby, it provides a comprehensive framework that helps managers to translate the vision and strategy of the organization into tangible goals and performance measures through the implementation of these four perspectives.

The four perspectives

As mentioned before, the BSC recommend to view an organization's performance from four perspectives: financial, customer, internal business process and learning and growth. They are all linked to the organization's overall strategy and aim to translate the vision and strategy into measurable objectives (Norreklit & Mitchell, 2007). The four perspectives can be analyzed and discussed in detail as follows:

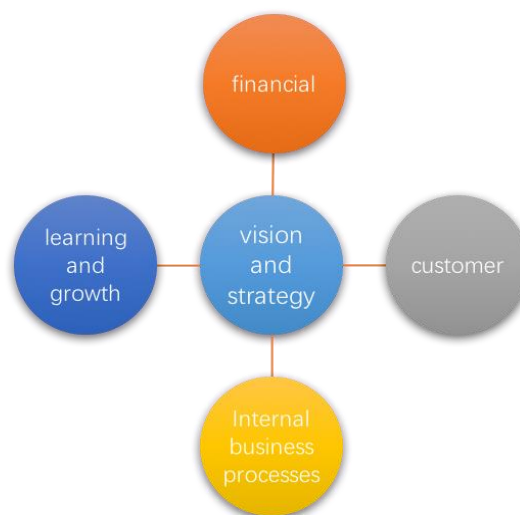


Figure 2: The balanced scorecard framework
Source: inspired by Kaplan and Norton (1996a)

The core goal of financial perspective is to solve the issue about how companies can satisfy shareholders' interest by increasing value of shares (Kaplan & Norton, 2005), which is related to the value creation for shareholders. The financial perspective describes the economic outcomes of actions taken in all the other scorecard perspectives (Wahdiat, 2016). Financial data can be measured when it comes to summarization of the past economic outcomes, which indicate whether the organization's strategy and the implementation of financial measures contribute to the profitability improvements. The financial perspective usually focuses on profitability that is associated with the growth of the shareholders' value and measures, such as the return on capital, a cash flow, a cost reduction in the major areas (Kaplan & Norton, 1996a; Giannopoulos et al., 2013).

The core goal of a customer perspective is to solve the issue about in what way companies can satisfy customers (Kaplan & Norton, 2005). The importance of the customers' satisfaction has been noticed due to the fact that, the unsatisfied customers would like to turn to a competitor company, which provides a more suitable product or a service. Thereby, if organizations want to achieve long-run financial objectives, they need to understand their customers' needs and to try to deliver items and services that are highly valued by customers (Kaplan & Norton, 1996a). The balanced scorecard demands that companies translate their mission on a client service into the specific measures that are aligned with the target- customers and large market segments. Besides, companies should figure out four types of the customers' concerns: time, quality, cost, performance and service (Kaplan & Norton, 2005; Giannopoulos et al., 2013). Based on these factors, an entity has to transform its targets into effective measures in order to increase the customer satisfaction, measured by developing market shares, a customer loyalty and by attracting new clients (Kaplan & Norton, 1996a).

The core goal of internal business process perspective is to figure out the processes that are the most crucial for achieving clients and shareholder objectives. In other words, the measures and the achievement of the customer's satisfaction and shareholder's value have to be supported by an internal process. Therefore, the measures in this perspective should be developed according to the processes that have the greatest influence on the customer's satisfaction and a company's core competencies. It will help businesses to raise their performance and to meet customers' demand better, and through that to retain their customers and to create value (Kaplan & Norton, 2005). Both Kaplan and Norton in 1996a and further Giannopoulos et al. in 2013 recommend managers to define an internal process value chain before designing measures for an internal business process perspective, that is considering from three processes are innovation process, operation process, and post-sale service to meet customers' needs.

The core goal of learning and growth perspective is to look at whether organizations might improve continually and create value for clients and shareholders. The ability of a firm to improve, learn and innovate ties directly to companies' value. Through the investments in human resources, in the new research and modern information technology, in systems and routines. Besides, businesses

can launch a new product, create value for customers, make a profit and increase a shareholder value (Kaplan & Norton, 2005). According to Kaplan and Norton (1996a), learning and growth perspective constitutes the core foundation for the company's long-term survival, by involving three sources: employees, systems and organizational alignment. It should also be notable that, human resources play an essential role in achieving the increasingly better performance in a knowledge-based company. Therefore, except for having competent employees and helping to improve their capabilities, firms should provide a supportive environment to make employees feel motivated and empowered. The example of measures for this perspective can be the R&D expense, the percentage of sales from new products and the employee satisfaction and retention rates (Kaplan & Norton, 2005; Giannopoulos et al., 2013).

In the learning and growth perspective, three kinds of intangible assets are necessary to support and to implement the strategies. First, human capital is related to strategic competencies, which includes skills, talent, and knowledge about how to perform strategic jobs. Next, the main requirements in information capital are company's databases, knowledge application, and infrastructure. Last, organizational capital consists of a company's culture, leadership, alignment of goals with strategy throughout the whole company, and teamwork (Kaplan & Norton, 2004).

The BSC as a strategic measurement system

Some companies move beyond using balanced scorecard as a performance measurement system and discover its value as a new organization's strategic management system (Kaplan & Norton, 1996b; Norreklit & Mitchell, 2007; Giannopoulos et al., 2013). The managers can use BSC to introduce four management process to link long-term objectives with short-term actions rather than rely on short-term financial measures (Kaplan & Norton, 1996b).

The first process – translating the vision – helps managers gain a clear consensus on the metrics they will use to describe their visions and strategies (Kaplan & Norton, 1996b). The second process – communicating and linking – enables managers to ensure that all levels of the company can understand the long-term strategy by communicating with all employees and link the strategy to individual objectives. To align individual performance of employees with the organization's strategy, the BSC offers three activities in the process: communicating and educating, setting goals and linking rewards to performance measures (Kaplan & Norton, 1996b; Giannopoulos et al., 2013). The third process – business planning – forces managers to combine their financial and business plans to support strategic goals. This process helps managers identify and undertake the important strategy initiatives of their long-term goals when they allocate resources and set priorities based on four perspectives measures (Kaplan & Norton, 1996b; Giannopoulos et al., 2013). The last process – feedback and learning – enables companies to make adjustments or introduce new strategies if needed. With this process, companies can obtain feedback on whether they have achieved their budgeted financial goals, monitor short-term outcomes and evaluate the existing strategies (Kaplan & Norton, 1996b).

In conclusion, it may be possible to agree with Kaplan & Norton (1996b) and Giannopoulos et al. (2013) that the balanced scorecard is used as a strategic management system by managers, which allows a company to adjust its management process and focuses the organization on implementing a long-term strategy.

Strategy map

When companies are intended to use the BSC, it is important to develop a strategy map. As strategy maps provide a visual framework of components of organization's strategy in a cause-and-effect relationship (Kaplan & Norton, 2004). With the cause-and-effect character, strategy maps present links between desired outcomes (lag indicators) and performance drivers (lead indicators), and show how resources should be managed, and results may be measured in order to achieve desired outcomes (Kaplan & Norton, 2000; Norreklit & Mitchell, 2007).

According to Kaplan and Norton (2000), building strategy maps involves two steps as follows:

Clarifying the mission and strategic vision: The vision should create a clear picture of the company's overall goal.

Specifying objectives in the four scorecard perspectives, which are necessary to realize this vision: In this step, according to Kaplan and Norton (2004), the strategy map is based on several principles. For financial perspective, the strategy should balance contradictory forces between the short-term objective for productivity improvement and long-term objective for revenue growth. For customer perspective, in order to differentiate from competitors, to attract and to retain targeted customers, it is necessary to choose one of the value propositions: operational excellence, customer intimacy, and product leadership. For internal business process perspective, since the value is created through the internal process, companies must identify operational, customer-relationship, innovation and regulatory processes to support their financial and customer goals. For learning and growth perspective, intangible assets and their roles in the strategy should be identified, such as human capital, information capital and organizational capital (Kaplan & Norton, 2004).

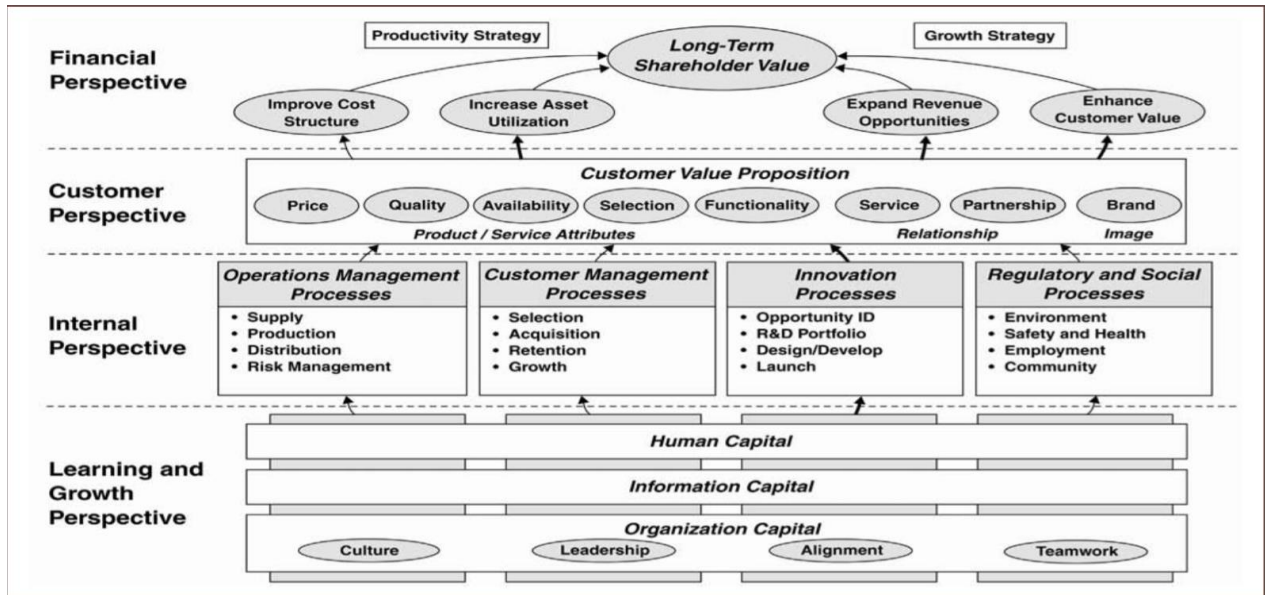


Figure 3: The strategy map framework

Source: Kaplan and Norton (2004)

To summarize, a table based on the above theoretical review, how the distortion of traditional accounting resolved by modern accounting tools shown in **Appendix # 3**. Overall, on the basis of four perspectives of the BSC, strategy maps can help managers and employees to have a better understanding of companies' strategies and to distinguish what is necessary to be done to convert initiatives and resources into visible outcomes (Kaplan & Norton, 2000).

3.3.6 The combination of modern accounting tools

The combination of modern accounting techniques was made by few recent academicians, however, none of them has provided a package making the combination of more than three accounting techniques in a time and customer driven orientation. A very few academic paper on management accounting concentrated to build a framework with a strong connection to the functions of operations with a view to make an improved engagement with manufacturing process. The latest investigation in the area was created by Medeiros, Santana, and Guimarães (2017). They analyzed the value increasing capacity of the lean accounting suggesting to link TD-ABC method for wastes minimization, concluding on the necessity of further examinations. The ground of the study for this paper is also strengthen with the research work by Monroy, Nasiri, and Peláez (2012), where the they examined the TD-ABC, ABC and lean accounting and emphasized the non-financial measures proving the connection between the TD-ABC and lean accounting. The findings in combing the TC and the BSC were produced by Souissi and Ito (2004). The academicians stated that the application both BSC and TC enable companies to balance among the cost, functions or quality and lead time. The application of the BSC and lean accounting also was made by Clinton and Hsu (1997), where the characteristics of a lean philosophy were reflected

through the BSC. So, Clinton and Hsu (1997), Monroy, Nasiri, and Peláez (2012), Souissi and Ito (2004) combined and linked the following tools together such as target costing and just in time with lean accounting. Whereas, Medeiros, Santana, and Guimarães (2017) and Monroy, Nasiri and Peláez (2012) are the proponents of the TD-ABC integration with lean accounting in their studies.

Thus, starting from the framework designed by Malmi and Brown (2008) and its cybernetic control part, we tried to expand it with the time driven orientated modern accounting techniques combining in a package. In this theoretical review, we foresee the strategy as the essential element in combining the TC+JIT+TDABC with lean accounting principles. Thereby, we presume that the balanced scorecard (BSC) may have an underlying connection with lean accounting. In our hypothesis, the emerging management accounting techniques such as TC+TDABC+JIT+BSC by combining in a package with the lean accounting may systematically support the lean manufacturing and the lean management. In this way, controllers or management accountants may be able to engage more closely not only into the production process but also in the market conditions. They can guide the production and marketing managers with the instrumental reporting in taking effective decisions. This will lead the controllers to play a vital role in the value creation process, contributing to the optimum resources capacity utilization process throughout the value chain.

Finally, it was noted that there is a limited number of publications in the area when most authors examined only the combination of less than three accounting tools without linking them in a package. These facts perhaps make the research innovative. In the way to conduct further investigations, the theories provide an interesting turn foreseeing the possibility to develop the the cybernetic control further in time-driven orientation combining modern accounting tools in a package.

3.4 The development of a framework on the theoretical perspective

The theoretical aspects of TC+TDABC+JIT+BSC were discussed in the earlier chapters by describing the underlying construct of lean accounting as the backbone of the framework. However, the surrounding environments such as strategy, ERP, reporting for decision making, resources, process and activities in the value chain within the system play an essential role in integrating the management accounting tools. The structure of the framework is influenced by the theory of Porter's (1985) "Value chain management", Porter's (1996) "What is strategy?", Ackoff's (1994) "System thinking theory", as well as the framework of Malmi and Brown (2008).

Therefore, on the ground of the framework of Malmi and Brown (2008), we magnify the cybernetic control part with the objective to develop this control area by putting in place modern accounting techniques by connecting them within a package. Besides, to make it applicable to the value driven companies, the surrounding environment was taken into consideration. By including the environment, the framework focuses on the essential elements of the system for taking effective

decisions through the strategy implementation, system thinking approach as well as dealing with the value chain management to drive the operations efficiently. The justification is that, if the process is optimized by ensuring a perfect fit of compatible parts together and wastes are minimized, then utilization of resources will improve value creation as a result of making informed decisions in controlling the value stream by undertaking the improvement initiatives, where it is needed. Further, the strategy, the system thinking and holistic view and the value chain analysis will be discussed.

3.4.1 Strategy

Firstly, let's consider the importance of the **strategy**. The framework conceives the importance of strategy, which derives from stakeholder salience, vision and mission. A strategy sets the structure of the value chain, resource requirement, risk appetite, and overall management control environment. Porter (1996) argues companies may continuously achieve best practices ensuring operational effectiveness, performing similar activities better than rivals. According to Simons (2013), it can be conducted by better utilizing its inputs, reducing defects and improving the speed in the employment process of the advanced technology, motivating employees or having a greater insight into managing activities better than others. Nevertheless, competitors can quickly copy the findings, and thus a competitive advantage becomes temporary.

According to Porter (1996), a company can outperform rivals only when it can establish a difference that it can preserve, by choosing deliberately a different set of activities to deliver a unique mix of values. Fullerton, Kennedy, and Widener (2014) and Rothaermel (2015) argue, the differences can be attained with the strategic positioning. It can be based on the serving majority or all the customers' needs, gaining access to the customers' segment in a different way, choosing to produce variety or subset of product or services.

As Porter (1996) mentions, strategy is about combining activities. Achieving excellence in individual activities is not enough (Rothaermel, 2015). Thus, companies would rather need to fit among functional policies, enforcing consistency between each functional activities and overall strategy, reinforcing mutually benefited activities among responsibility centers, suppliers, customers to reach in common goal the avoiding of the goal incongruence. "Fit locks out imitation by creating a chain that is as strong as its strongest link" (p, 70).

The success of a business depends on building or identifying capabilities, core competences, critical resources that can be defined as critical success factors (CSF). Porter in 1985 introduced three general strategies to gain the competitive advantage in his groundbreaking book. At present, the findings are supported by the current authors such as Grant (2016), Hill, Jones and Schilling (2014), and Magretta (2013). They are the following:

Cost leadership: A company's cost position reflects the collective cost of performing all its value activities relative to rival. Each value activity has cost drivers that determine the potential source of the cost advantage.

Differentiation: A company's ability to differentiate itself reflects the contribution of each value activity toward the fulfillment of client needs.

Focus: The focus strategy puts attention on a particular segment only. The attention may be based on the differentiation of uniqueness perceived by customers or a low-cost position to gain the cost leadership in specific customer groups.

To summarize, a strategy is transmitted in three stages. (1) A corporate strategy, which comes from the top management in the hierarchy. (2) A business unit's strategy (SBUs) that represents a strategy for different companies or units under a corporation. (3) A functional strategy is a strategy, taken by the department in charge of finance, marketing, operations, purchase department, etc. General management plays a key stewardship role in the strategic process by making a choice, defining and communicating the company's unique position and by ensuring fit among activities, functional areas (Porter, 1996). Our framework encourages circular organizations with a democratic hierarchy, where managers can manage interactions of their units with other units of the organization or with other organizations (Ackoff, 1994; Hill, Jones & Schilling, 2014).

3.4.2 System thinking

Further, it is necessary to examine **the system thinking and holistic view**. According to Ackoff (1994), a system is a whole consisting two or more parts, each of which can affect the performance or properties of the whole, none of which has an independent effect on the whole, and no subgroup, which can have an independent effect on the whole system. According to the scientist, an enterprise creates a system within the social system in which people individually and collectively play the major roles. The system is a whole that can perform only when its' independent parts are compatible and fit together properly, becoming a function of their interactions. Therefore, management may focus on the interactions of its parts rather than on their actions taken separately. According to Lee (2016), a synergy is an increase in the value of the system's parts that derive from the membership in the system, when those parts create interactions with other parts. Besides, Birkie (2016) stated that a lean philosophy includes a synergy effect by setting up a time-driven system, combining different operational processes.

By returning to Ackoff (1994), the scientist argues that by the understanding of a system, it cannot be possible to analyze each part separately, as it cannot explain the behavior of the properties as the whole. Thus, he proposed to make a synthesis together with other parts of the larger whole to understand the function and the role affecting the whole system, and then it can capture their essential properties and their behavior.

In our framework, we were inspired by the Ackoff's (1994) system thinking theory, as it was considered that the individual management accounting tool could not capture a whole spectrum of the value chain effect. To gain better visibility and control over value chain, management

accounting tools have to be employed simultaneously. Moreover, when management techniques such as JIT, TC, TDABC, BSC can be employed in a package with proper fit with each other, then they can make a synergy effect. According to Birkie (2016), by synthesizing the lean accounting reports in a combination, it can support lean management and lean manufacturing, which in turn will ensure increased direct engagement of controller with manufacturing, R&D, and marketing process.

3.4.3 Value chains analysis

According to Grant (2016) and Porter (2001), the business of a firm can be described best as the value chain, when all the activities develop marketable products or services to yield a value, which represents the difference between revenue and total cost. A value chain disaggregates a firm into its strategically relevant activities to understand the behavior of costs. Porter and Millar (1985) describe a company's value chain as a system of interdependent activities, which are connected by a linkage. The linkage creates the way in which one activity is performed affect the cost and effectiveness of other activities are designed. The linkage also requires other activities to be coordinated. For example, on time delivery requires operations, outbound logistic, and service activities to be maintained together. A coordination system is not necessary only inside a company, but also in outside environment of the organization with other stakeholders in the value system (Gereffi & Fernandez-Stark, 2016). Therefore, firms need to strive not only to understand internal parties such as employee, management but also their competitors, suppliers, and customers, etc. (Porter, 1985; Peppard & Rylander, 2006; Zamora, 2016). A value chain established a principle that a competitive advantage can be reached by managing the entire value chain including all the involved functions and activities.

Value Chain: An internal value chain consists of primary activities for instances such as inbound logistic transportation and warehousing, production in the form of operation or manufacturing, outbound logistic as delivery and distribution as well as marketing and after sales services. A value chain includes supporting activities such as procurement, human resource, research and development, information technology, etc.

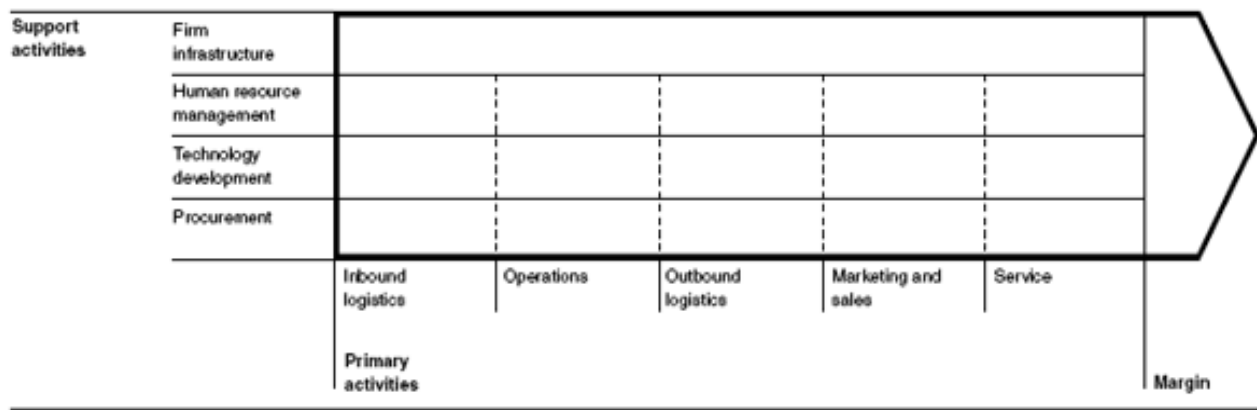


Figure 4: The value chain model
Source: Porter and Millar (1985)

A value system: As Porter and Millar (1985) define the value chain for a company in a particular industry to be embedded in a large stream of activities that recorded as a value stream. As they elaborated, the value stream remains connected with the value chain of suppliers, who provide inputs to the company's value chain. The company's product or services are delivered to the ultimate customers through the channel's value chain, sometimes sharing the downstream value chain of the company with suppliers.

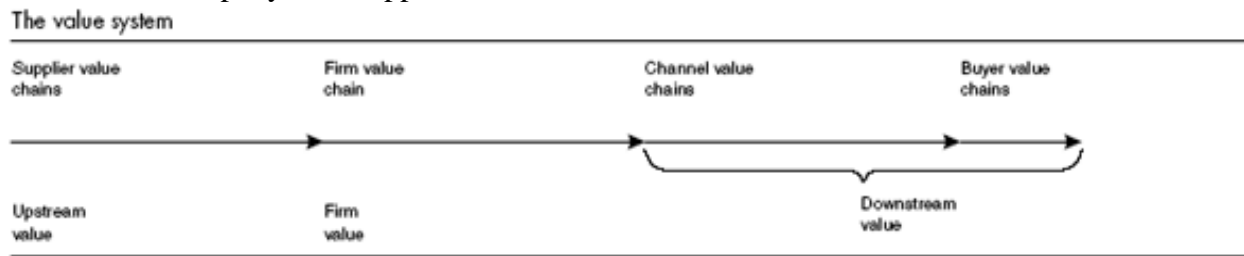


Figure 5: The value stream

Source: Porter and Millar (1985)

A value chain network: Kannegiesser (2008) defines that 'the value chain network structure is built on the assumption that not all but specific company-internal value chain information can be shared with customers and suppliers specifically capacity and inventory related information'. It influences the inter-organizational model of business relation, which has a vertical integration and combines one firm's processes at the two or more production stages that are typically operated by separate firms.

By doing that, a company can create a competitive advantage by optimizing the link among inputs of resources, activities, and outputs inside the value chain as well as within the value stream outside the value chain (Porter & Millar, 1985). The term optimization was defined by Ackoff (1994) as performing something that yields or comes close as possible to the best possible outcome. This involves a research approach to problems, the solution of which heavily relies on experimentation, quantitative analysis and uncommon sense (Zamora, 2006; Grant, 2016). There are few methods for value chain optimization.

- i) Mathematical approach. For instance, linear regression, equation, genetic algorithm, etc.;
- ii) Analysis and visualization method by using graphs and charts etc.;
- iii) Simulation-based optimization that includes spreadsheet simulation, system dynamics, etc.;
- iv) Accounting methods. As an example ratio analysis, variance analysis, value-added analysis, etc.;
- v) Statistical methods, such as standard deviation, probability analysis, etc.

In this framework, the focus was made on optimizing the utilization of resources capacity mainly due to accounting methods in support of a simulation, based on the optimization method by using spreadsheets and a business intelligence tool to analyze and to visualize the result of output for taking action for continuous improvements.

3.4.4 The automation and integration of ERP

According to Porter and Millar (1985), information technologies have an important role in the way the value activities are performed and become the nature of linkage creation among them. Information technology has acquired a strategic significance in reshaping the way of service and product meet the customer's needs. Davenport (1998) specifies that the commercial software packages are available in the market, which integrates all the information flowing through a company's financial and accounting, human resource, supply chain, customer and sales modules. However, he argues that a ready-made ERP imposes its logic on a company's strategy, organizational structure, and culture by pushing a business in the general process, even though a customized process may be a source of the competitive advantage. The contemporary accounting systems are prescribing to attain strategic objectives, implementing TC, TD-ABC, JIT, BSC and Lean accounting by connecting together. This new system would require additional financial and non-financial costs, quantity and quality related data throughout the value chain. Thus, the design of data entry, data table, query and reporting template would need to be programmed in a different structure. Furthermore, the system requires being so much adaptive and flexible as ERP can incorporate changes quickly due to the strategic action to take the financial, HR, R&D, production, supply chain and marketing areas (Hsu, 2013). The system would have to capture all the process, activities from the source of transactions initiation.

It is being observed in our survey that most of the organization hold a separate system or the system is partially integrated (**Appendix # 9**). Davenport (1998) states that maintaining many different systems leads to enormous costs for storing and rationalizing a redundant data, for debugging an archaic software code, for programming to make the communication link among the system to automate the transfer of data. Thus, the efficient system needs a central platform, so that it can automate a transaction from data input, processing data output without much human interaction (Hsu, 2013). In this way, the dependence among inter-functional departments can be reduced by full integration and automation of activities through the value chain within the ERP. According to Chen, Liang, and Hsu (2015), the coordination can be even more efficient with external stakeholders, when the ERP can be connected with supplier's, bank's and customer's ERP with the EDI, FEDI, POS, cloud computing technology. Then, improved real-time communication will enhance the implementation process of JIT, BSC, TC, TD-ABC and lean accounting.

3.4.5 Reporting and decision making

According to Cardin (2007), Business Intelligence (BI) is a broad term used to explain procedures, architectures, applications that transform raw data into the meaningful information in order to support business operation. Zheng, Zhang, and Li (2014) describe different components found in the BI system, namely: data management and integration, analysis, presentation and delivery. It involves some interaction and visualization tools that add the additional insight and understanding to the decision makers (Tegarden, 1999). Among the techniques are: reporting (static and interactive reports), digital dashboards, and more specific analytical visualizations. It is important

to highlight the main difference between the first two report types (static vs. interactive). The interactive reports enable the user to modify according to their expectations the appearance of the data through searching, filtering, sorting, column selection, and other data manipulations. Zheng, Zhang, and Li (2014) argue that the presentation component brings a sense-making and the decision support directly to users. Business intelligence produces the analytics that drives the transformation of data into relevant information and knowledge, which, in turn, supports the decision making.

According to Cooper and Kaplan (1991), to reduce operating costs, managers need to understand patterns of resource consumption at the macro level. In this connection, the ABC analysis enables managers to slice the business in many different ways - by products, by individual customers or client group, by distribution channel, regions that give a close-up view of whatever slice they are considering. The ABC analysis illuminates which exactly activities are associated with the generation of revenues and the consumption of resources (Kaplan & Anderson, 2013). By highlighting those relationships, the ABC helps managers to understand precisely where to take actions that will drive profits. If the overhead is higher than expected, management reviews pricing, product mix, and process improvement decisions (Monroy, Nasiri & Peláez, 2012). The ABC assists in deciding whether any nonvalue-added activities can be outsourced from a low-cost provider or whether there is any scope to initiate an inter-organizational type of network based relationship to amplify the JIT supply chain. Moreover, the ABC analysis facilitates with comparing profitability in product wise, customer wise, brand wise or region wise. The analysis may direct a pricing strategy by rising prices for products that make a heavy demand on support resources and new product mix or customer mix. Alternatively, by reducing the resources consumption to produce the current mix of goods or services, customers can be led to cutting a discount or credit facilities or a credit term to unprofitable customers (Medeiros, Santana & Guimarães, 2017). Reducing of the resource consumption gives managers an opportunity to increase throughput, decrease spending to boost profits. The profit and cost controlling have the objective to provide cost and profitability information as a necessary support for management decisions on business and investment activities, using the value-based indicators e.g. measuring costs and cost-effectiveness of the company, customers, products and/or locations (Kannegiesser, 2008). The target costing that incorporates kaizen or continuous improvement includes a decrease in a setup time, better factory layouts, a rise of material flows and development of all techniques, which reduce the resources required to handle batches. In target costing, managers put pressure to product designers, suppliers to create a product with cost effective parts. The advanced information and manufacturing technologies can also decrease the demand for resources at the batch level.

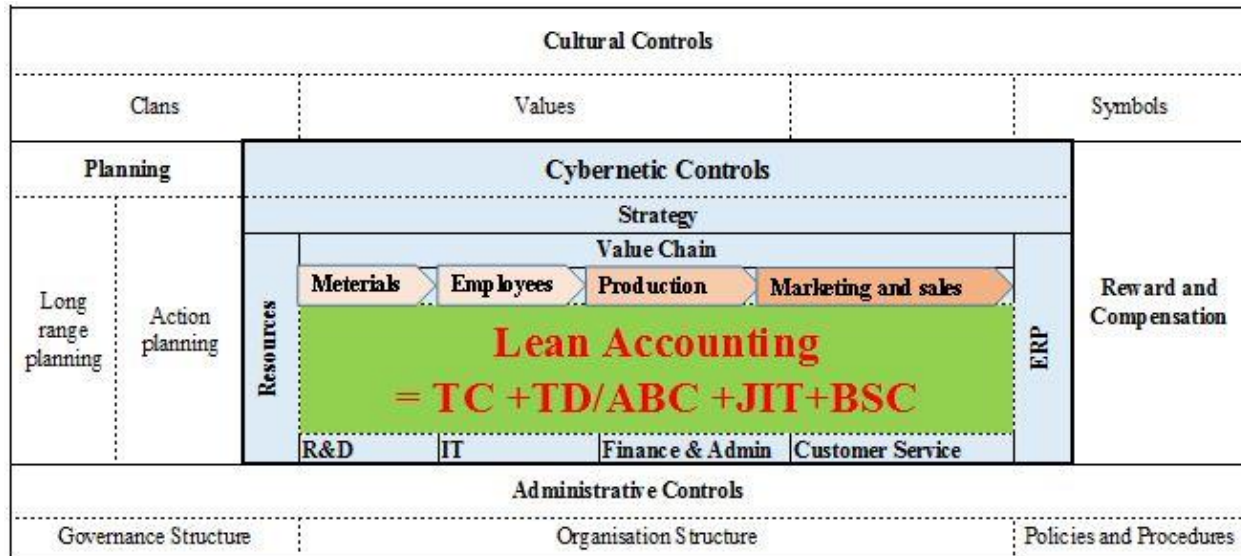


Figure 6: Framework: illustrating a value creation process through the value chain with an integrated management accounting package adapting in the framework of Malmi and Brown (2008) elaborating a cybernetic control.

As it can be seen, the cybernetic controls of the framework of Malmi and Brown (2008) is enhancing in more time-driven and lean accounting direction. In the framework, illustrated above, it is apparent that the value chain management injects a strategy into activities throughout the process in the value streams by using balanced scorecard (BSC). Further, the enterprise resource planning (ERP) captures the activities and transactions in the workflow populating a database. A customized database is required for analyzing and presenting a value chain information in the templates, designed by the entity in accordance with the strategic or a decision-making need. In this context, the integration of TC+TD-ABC+JIT+BSC techniques in the value chain may promote the lean management, which plugs in the connection among primary and support activities, providing insight of the global value creation process by measuring the performance of resources. The strategy is transmitted into activities that monitor a performance of the workflow in real time using JIT, TD-ABC, and Value Stream Box Score. Thus, these integrated controls facilitate management to make effective decisions, as well as the action plan for improvement in line with the strategic priorities at different levels to optimize the capacity utilization of resources across the value chain. In the following chapter, this paper aims to establish the framework integrating management accounting techniques to optimize capacity usage of resources across the value chain in a real-life scenario.

4. Empirical Findings

The empirical part starts from the indicative assessment of management accounting practices through the survey data in order to develop a general understanding of the current trend in practices of traditional and modern accounting techniques applied by professionals in reality. Furthermore, the case company's history, mission, vision, strategy, organizational structures, financial system, process map and system map are explained in details to clarify the workflow, activities and operational process within the value stream. That is to make the application of a framework understandable in the case company context. The result of the application of designed framework is justified by combining numerical analysis of data collected from the annual financial statements. Finally, this chapter describes the importance of integration and automation of financial system to support the linkage of accounting techniques together in optimizing the usage of resources.

4.1 Analysis of survey data on management accounting practices

The survey data was collected from professionals to form the understanding of the management accounting practices around the management control system in the start point of the study. That provides a generalized conceptual base on the current situation of the traditional accounting application, its limitations and usage of new accounting techniques. We have collected and analyzed 20 responses of professionals practicing around the globe (**Appendix # 5**) from 11 countries. The most of them (40 %) are from mid-sized companies, others 33.33% answered from small size firms respectively thereby the remaining 26.77 % represents the practitioners of a large entity. Approximately 80% of the respondents represent the service-oriented industries, and 20% of them belonged to the manufacturing sector. Further, only 45% of respondents reported that their plan and policies are codified into the standard operating procedures (SOP) (**Appendix # 6**). Whereas other 50 percent of them was partially directed by the drafted rules and the regulations, which indicates that the management accounting system is vastly based on the discretion of practitioners in charge of the finance and accounting departments. In the result, by running the functional areas without a clear instruction, it can lead to the goal incongruence and a lack of aligning the corporate strategy on top of their functional strategy.

Despite the criticism in the traditional accounting system about its shortcoming such as the distortion of allocation production overhead, inventory buffer, shareholders' silence and so on (Romney & Steinbart, 2015), the empirical survey reflects that the conventional accounting is still predominantly practiced. For example, budget and forecasting techniques got the highest adoption rate (60%), followed by second the highest break even analysis (45%) and then after the investment appraisal techniques (30%) by using the NPV and the payback period (**Appendix # 7**). Conversely, the target costing approach (45%) is at the forefront of popularity among contemporary management accounting tools, whereas the just in time manufacturing control is 35%, and thirdly, the Balanced Scorecard (30%) most practiced techniques among modern management accounting tools. Thereby, we can come up with the result that some traditional accounting approaches still play a vital role in the value creation of the firms.

The traditional way of allocating overhead, based on the labor hour rate was found (**Appendix - 8**) as the most practiced (55%) way of sharing indirect cost on products, departments, and customers. Whereas only 10% of respondents adopted the Activity Based Costing. Maybe, that is due to the fact, that the population of our sample data mostly represent small and medium-sized firms from a service sector.

The accounting tools and techniques are mostly used to report the performance of cost centers (73%), product profitability (67%), consumption of resource by a process or a cost center (47%), consumption of resources by activities (40%) and benchmark of the performance with competitor's performance (40%). Therefore, it can be agreed with the ideas of Monroy et al. (2012) that the possibility of implementing lean accounting, integrating balanced scorecard and activity-based costing was justified as contemporary techniques can produce those reports more efficiently and accurately and can be considered for further implementation.

Since 90% of respondent stated that they use the ERP integrating supply chain, manufacturing, operations, human resources, sales, customer services activities. Therefore, it reveals the importance of the implication of the information technology automation and its integration in the accounting functions (**Appendix # 9**) again. Thus, a system needs to be so highly adaptive and flexible as the ERP should manage changes quickly to support the financial and operational strategies of the companies (Hsu, 2013). However, only 25 % of practitioners reported that their ERPs are fully integrated. The predominant (45%) ERPs are partially integrated, and 20% of participants informed us that they have separated systems. Therefore, it seems there are still challenges remain in the phase of integrating processes in ERPs. Also, 45% of respondents disclosed that they use Business Intelligence tools in the financial reporting, though 80% of them use the Microsoft Excel as the BI tool (**Appendix # 10**). Thus, it can be concluded that Excel is the most popular tool for practicing accounting functions and presenting reports to the stakeholders.

The data above formed the environment around the framework in the development of our package by including the strategy, ERP, BI as essential elements in the implementation of TD-ABC, TC, JIT, BSC and lean accounting linking together. This part of the empirical analysis also contributed in choosing the direction and selection of theoretical studies. In the next chapters, the information about the case company and an application of the designed framework, based on the financial records and its operational direction will be presented.

4.2 Case Company

The company, AdPeople A/S, was founded in 1999 by the visionary entrepreneur, Ronnie Job, in Copenhagen, Denmark providing services such as digital marketing contents to enterprises such as Coop, Boehringer Ingelheim and Intersport. The company AdPeople has become a global advertising agency network since then that operates in a digital world, locating market-specific offices in Shanghai - China, Bangalore - India, Tokyo - Japan and New York - the USA (Wpp.com, 2017). Also, it has a 24/7 global production service hub in Dhaka, Bangladesh.

The two digital production studios are located in Bangladesh. The first company is registered as Graphic People Limited; another studio is named as SoftwarePeople BD Limited with the joint venture initiatives in collaboration with a local advertising company AdComm Limited. Both business units are in Dhaka, Bangladesh, are offshore studios that provide digital, print and software production support services to advertising agencies and brands around the world (Graphicpeoplestudio.com, 2017). Those companies were established in the inter-organizational model with an objective to deliver cost-efficient global catalog production, print support and brand implementation for Dell and marketing needs of other clients (McEwan, 2008).

According to McEwan (2008), on 26th of June 2008, a holding company WPP inc. announced in a press release that “it became wholly-owned operating company named Enfatico LLC, the global marketing services firm designed specifically for Dell Inc. (NASDAQ: DELL), as its first client has agreed to acquire a majority stake of the issued share capital of AdPeople A/S in Denmark”. At that time, they had 160 employees in their offices in Copenhagen, when Denmark and Dhaka, Bangladesh, became members of the WPP (NASDAQ: WPPGY) (McEwan, 2008). As per the report of Bloomberg (Bloomberg.com, 2017), Enfatico LLC was incorporated in 2007 and its head office was based in New York with additional locations in Austin, Beijing, Buenos Aires, Costa Rica, London, Miami, New York, San Francisco, Sao Paulo, Singapore, Sydney, Tokyo, and Toronto. However, later, Enfatico LLC, USA was acquired by Young & Rubicam, Inc., USA in 2009. Only 16 months after incorporation of Enfatico LLC, it set out to build a 1,000-person marketing agency to serve Dell's needs, the London-based holding company WPP has folded the start-up into its Y&R Brands. Y&R Brands, USA include other entities, for instances Y&R Advertising, Wunderman, Burson-Marsteller and Landor (Parekh, 2009).

Martin, CFO of AdPeople describes “since the WPP Inc in the USA is an ultimate parent company, the Adpeople, as a strategic business unit (SBU), incorporates strategy of the WPP as the strategic priority of AdPeople.” As Martin, CFO explained in “June 2016 AdPeole A/S was completely acquired by Wunderman.” Wunderman is a network of advertising, marketing, and consulting companies with offices in 60 countries. In a world where clients struggle to derive value from the volumes of data they collect, Wunderman with 7,000 data scientists, creatives and executives identify powerful culture insights and solutions that inspire action and deliver measurable business results. Wunderman, headquarter in New York City, is a part of Young & Rubicam Brands and a member of the WPP Group.

4.2.1 Mission, Vision and Strategy

In 1985 the WPP Inc. Martin Sorrell takes a stake in the 'Wire and Plastic Products' which was an UK manufacturer of wire baskets. He converted the business to build worldwide marketing services company listed on NASDAQ Exchange in New York in 1988. The WPP is the world's largest communications services group, employing 200,000 people who are working in 3,000 offices in 113 countries. In 2015 Martin Sorrell was ranked No. 5 in the Harvard Business Review's 100 best-performing CEOs in the world. For the sixth consecutive year, in 2016, the WPP has titled the Holding Company of the year at the Cannes Lions International Festival of Creativity (Wpp.com, 2017).

The mission statement of WPP is quite elaborate as follows:

“WPP exists:

To develop and manage talent;
to apply that talent,
throughout the world,
for the benefit of clients;
to do so in partnership;
to do so with profit”.

The clients of WPP have access to companies with all the necessary marketing and communications skills. The client's companies became famous for their strong and distinctive culture.

The parent company WPP complements these companies in three distinct ways:

The WPP relieves on their companies much of administrative work. Financial matters (such as planning, budgeting, reporting, control, treasury, tax, mergers, acquisitions, investor relations) are controlled centrally. This frees up WPP companies to devote their time to the pursuit of professional excellence.

The WPP encourages and enables their companies of different disciplines to work together for the benefit of clients and the satisfaction of their employee. In the management of talent, the parent company plays an across-the-Group role.

As a recent development, and for a minority of clients, the WPP can function itself as the 21st century equivalent of the full-service agency, acting as a portal to provide a single point of contact and accountability" (Wpp.com, 2017).

The key strategy of the WPP can be defined as a corporate one, which is applicable for the AdPeople A/S as well. The content of corporate strategy is that the corporate financial and management controls of the case company are in the hand of the WPP. As Morten, FD, describes

“the WPP defines the boundary system for its business units based on the corporate strategy. It also takes care of the long-term planning, management control as well as performance and rewards for its business units, which are codified in the policy and procedures.”

Nevertheless, as Martin, the CFO of AdPeople replied as “the cultural control and administrative control including interactive controls are controlled by the local management. Management of business units is responsible for taking an action plan, business strategy and functional strategy, which are informal and taken according to the demand of situation and changes on a day to day basis.”

4.2.2 Internal Reporting requirements

Morten, FD describes “the AdPeople's internal reporting requirement is based on the WPP accounting policy and procedures, which codified in SOP for the finance department’s functions and make CFO/Finance Directors/Controllers responsible for general supervision and administration. Non-compliances can lead to disciplinary action and face adverse Sarbanes-Oxley consequences. For local SBUs reporting requirement is based on IFRS and the policy outlined by the WPP. The system SAP BFC is formally called Cartesis that is the central management reporting system, where all entities are affiliated, further WPP submits all reports in compliance with WPP reporting requirement. In case the local external statutory report is different from the BFC, then a reconciliation report is needed to be reviewed by a regional office.”

He adds “the Group periodically produces Internal Controls Bulletins, which is another useful source of reference on internal controls and related policies to implement the changes at the IFRS and SOX controls.”

4.2.3 Accounting system: How data transmit across value chain finally into the reporting

Jose, VP, explains “the budget and forecast financial information provides the basis on which WPP’s strategic decisions are taken and is the basis for WPP’s briefings to bankers, analysts and investors. It is essential that management’s most realistic estimates, not excessively optimistic or pessimistic, be used in compiling this financial information.

AdPeople as all other operating companies have local accounting system, Microsoft Business Dynamics Navision which enable the case company to generate report within the time frame communicated in reporting calendar annually for reporting financial information required by headquarter of WPP in intranet based Group's reporting system SAP BFC formally known as ‘Cartesis’.

AdPeople as reporting unit, to comply the group policy, prepare Flash report in BFC in a monthly basis, typically four working days after the month end. Flash comprises a number of key P&L

figures, including revenue, gross margin, operating profit and PBIT, together with figures for incentives, severance, working capital provisions and external and intercompany interest. Flash includes management P&L reporting. Nine working days after the month end AdPeople required to report full profit and loss statement, balance sheet together with range of supporting analysis including revenue by clients, aging of receivables by clients, headcounts, cash-flow information. At actual reporting units supply a revised revenue forecast for following three months and remainder of the year.

Forecast: After a quarter end, within following 12 days, AdPeople required to submit an updated month by month reforecast of their results for the current year, including management P&L, resources and a capex forecast.

Budget: Also operating units submit a budget in BFC to WPP in early November in respect of the following financial year. This will include a month by month P&L budget, including MPLB and supporting analysis, as well as additional data, including capex and detailed real estate information. At the same time a current year pro forma will be required, based off the Q3 reforecast, reflecting the full year results of acquisitions made in the current year. In preparing budgets WPP's operating groups should have regard to the Group's financial objectives which includes growth of operating profit, improvement of operating margin, staff cost to revenue, salary growth at no more that 3/4th of the growth in revenue.

The WPP sets objectives for each operating group that addresses the following overall targets.

Variance: During each reporting submission, commentaries are required to explain major variances on the main P&L headings. This is an important aspect of effective and efficient reporting for WPP. The commentaries have to comprise a sufficient summary of variances for WPP and HQ's to understand the key drivers of major variances.

Corporate responsibility reporting: AdPeople has to report the 'corporate responsibility' (CR) reporting pack in BFC within 30 days of the end of the quarter. This quarterly submission requires a variety of data about corporate and social responsibility issues, including energy usage, ethnic diversity, employment, compliance with marketing standards.

Client profitability: Further, a quarterly analysis of customer profitability is also required to submit within 30 days after each quarter end.

Overhead: As a part of the budgeting process, an operating group sets its budgeted overhead allocation rate for the coming year.

Balance sheet analysis: After each quarter-end, WPP Group Reporting performs an analytical review of other balance sheet captions, i.e. 'non-controllable' accounts. The quality and timeliness of explanations from the companies are critical to this process, which is also a key from the audit tool.

The procedure as mentioned above is followed by AdPeople to meet the internal reporting requirements in a more visualized process presented below in **figure# 7:**

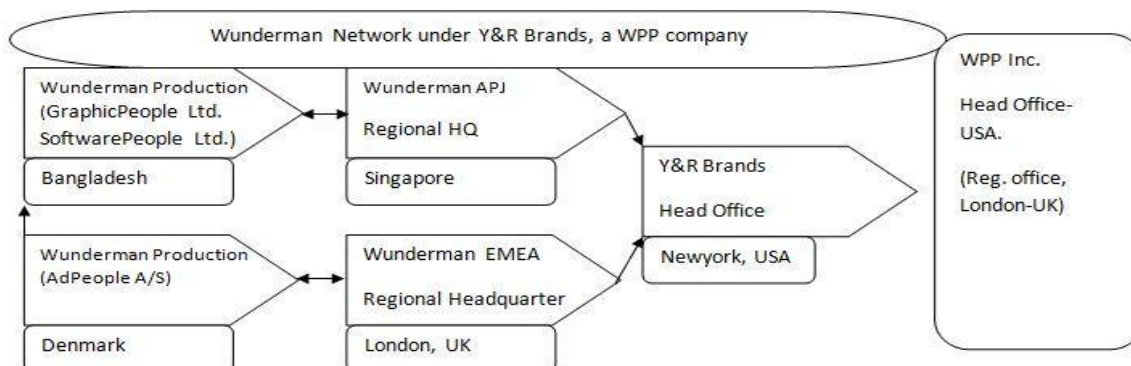
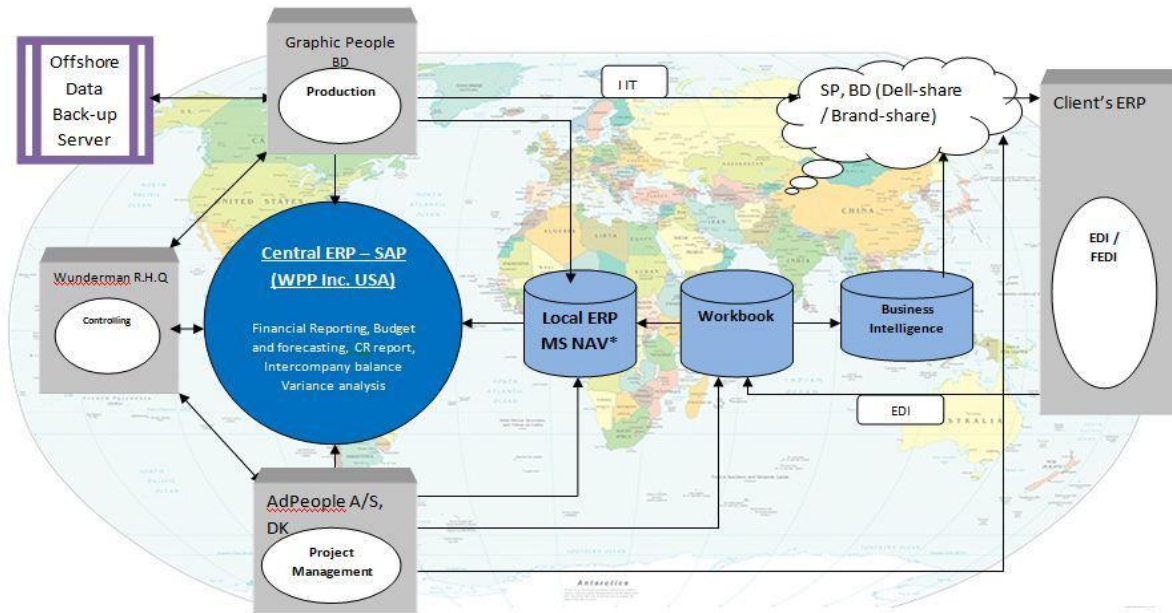


Figure 7: Reporting channel in the network relation of the case company

4.2.4 Implication of information technology

Chris, CFO, AdPeople explained that the company has an external reporting requirement to meet the customer needs for which a project management system, named ‘Workbook’ handles the project related data of AdPeople. The project related data such as the time registration, time reporting, cost estimation, revenue, suppliers invoice, purchase order and sales invoices are processed in this system. Also, a business intelligence tool called Tableau is used for client finance reporting purposes. Tableau uses the data from Dellshare and workbook. All the production data store in a cloud based data warehouse using the interface Dellshare. As Jose, VP, says “Dellshare is the web-based application that manages fork-flow data recording non-financial activity related information.” This tool is developed by SoftwarePeople and updated constantly as per the requirements of Dell. Offices of AdPeople and Dell all over the Globe use this to get access to the advertising materials produced by production hubs. Production files are stored in the file server into the on-site data-center as well as on offshore data backup servers. This database is also stored in Amazon cloud server at the same time.



Figures 8: System map

4.3 The application of the framework

The framework is derived from the limitations of the conventional accounting system, which are not unique to the case company. However, we used the process, activities, accounting system of the case company to apply the framework of lean accounting for incorporating TC+TDABC+JIT+BSC. The objective was to identify whether there are some connections among those modern accounting tools, which can be implemented by the lean accounting within a package in general. The ultimate purpose was to explore the underlying construct and capacity of those tools by contributing optimum utilization of resources across the value chain of any international profit-oriented organizations.

Based on the interviews with officers of the case company and after the evaluation of the entities documents, we draw a process map at first (**Figure # 9**). Apparently, there are three distinct value streams within the process map those are the next. (1) AdPeople is responsible for a customer order handling, which is formally developed into the 'scope of work,' briefing the projects or jobs to creatives and developers, development of creative concept and layout, account management and finally evaluating the performance and customer satisfaction. (2) SoftwarePeople Ltd. develops cloud-based tools 'Dellshare' and 'MarCom box,' so that the production files and media assets can be stored and shared among customers, AdPeople A/S and GraphicPeople Ltd. These platforms work as a virtual transportation system to upload and to download digital productions. (3) GraphicPeople is responsible for regionalization or localization of digital marketing campaign contents (web banners newsletters, catalogs, posters, stickers and so on) of Dell and other clients. GP run the production through online (web development) or offline (Desktop Publishing)

production, quality assurance. Finally, orders delivered to the customers uploading into the dell-share platform at the cloud-based interface. In the second step, activities were identified to understand the workflow within the process in executing customer orders.

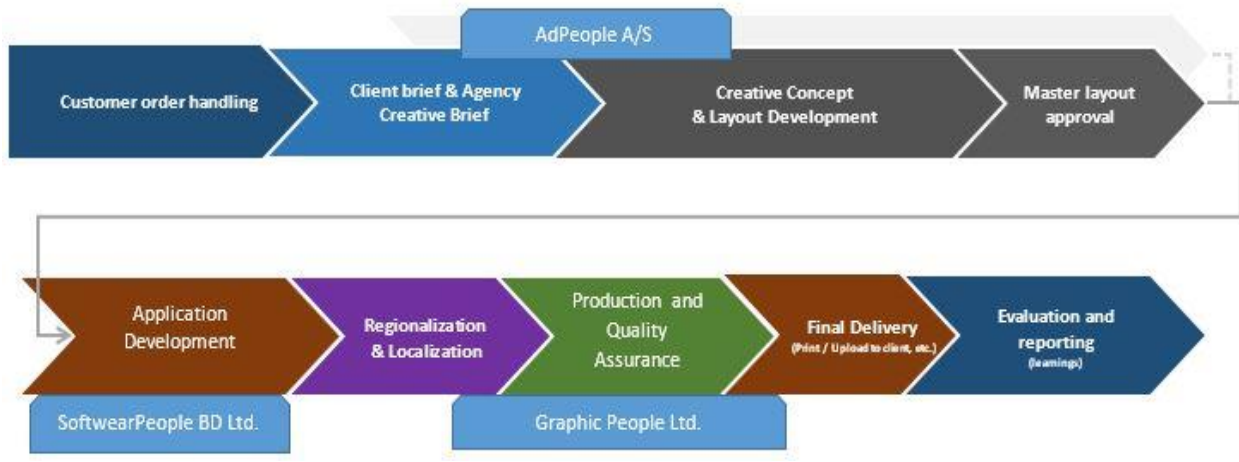


Figure 9: Process map of AdPeople A/S

Afterward, a dummy data is used to design a database. The actual data is not used to respect the confidentiality of the case company. Designing the database is the most important task as it was observed that the database of the existing accounting system is not enough to produce quality and time-related metrics. At the same time, the framework required data from other departments, such as the data from human resource department to calculate employee engagement, operations data to calculate process time, first pass quality rate, the cost of rework and sales data to ascertain customer satisfaction indexes. Thus, it indicates the need for customization, integration, and automation of various departments within the ERP. The database of ERP essentially needs to be designed in a way so that it can capture all the required data throughout the value chain from the source point of the start of activities to the end point of the execution of delivery and transactions.

Like Martin, the CFO of AdPeople stated the company’s project management tools Workbook records the process data on the workflow. This project management application creates jobs for the particular order. Suppliers invoices assigned to the particular job if the cost is directly associated with that job. Frontline employee hours are directly registered to the jobs. The other charges such office rent, depreciation, repair and maintenance as well as in the case of non-billable hours a sick leave, meeting time, training time are considered as indirect costs. So, those overheads, indirect costs are allocated by using the tools from the TD-ABC costs in the testing phase of a framework. However, at the time of product costing (rate per men-hours), which is called ‘rate card’ in the case company, it starts with the target costing principles. ‘The scope of work’ is the base for the number of full time employees, whose role can be accurately known before the year begins. Though the costs are taken based on estimation and forecasting is usually taken from budgeted figures.

4.3.1 Application of Target Costing

The implication of target costing in the testing of framework firstly starts at just before the year begins, as a budget for the following year starts from November of the years. In theory, Ax, Greve and Nilsson (2008) describe target costing, in a customer-oriented approach, is essential to consider customer needs in the planning phase through discussions with customers. Then, on the basis of relevant information, such as company's objectives, customer requirements, and sales volume, the company could determine the allowable cost and decide in what approach costs should be allocated. In the case company, according to Jose, AVP of Wunderman, the budget is prepared for the coming year by identifying the customer requirements. Intense negotiations and discussions with a client take place so that the case company could forecast the sales figures and numbers of FTEs in different roles. Based on the customer requirements and a sales budget, AdPeople prepares the staff budget specifying different roles. Moreover, a rate card should be ready for various roles as required by customers. A company should close the cost gap to optimize relationships between its different production processes and make the continuous improvement to achieve a better budget allocation and cost reduction (Ax, Greve & Nilsson, 2008). This is firstly done through the communication that takes place between inter-companies, GraphicPeople and SoftwarePeople, to figure out whether the cost and service requirements they can accomplish. Then rate card, cost, quality and functionality issues, and revenue budgets are continuously reviewed and coordinated among inter-companies to find how they can fit into the customer budget and requirements. Finally, when the rate card is perfected co-ordinating with productions hub in Bangladesh, then AdPeople pass the rate card to a client. Afterward, the rate card is approved by a customer, which is revised in every quarter in the budget updates. In this process, the activity based costing is applied to calculate the rate per hour of different roles.

Target Costing Report

Particulars	VALUE STREAM			TOTAL Amount
	GP	SP	AdPeople	
Budgeted revenue (Yearly)	480,000	120,000	1,032,000	1,632,000
				-
Margin (10% of revenue)	48,000	12,000	103,200	163,200
				-
TARGET COST (for the year)	432,000	108,000	928,800	1,468,800
				-
Numbers of head count	150	30	30	210
				-
HEAD COUNT SPECIFICATION				-
Creative	0	0	8	8
Production	129	22	5	156
Quality Check	9	6	2	17
Project Management	12	2	15	29
				-
RATE per minute as per TD/ABC				
Creative	-	-	0.11	0.11
Production	0.026	0.032	0.10	0.15
Quality Check	0.026	0.034	0.10	0.16
Project Management	0.033	0.045	0.10	0.18

Table 2: Target costing report

Target costing contributes in the optimizing utilization of resources by finding the best possible way to reduce the cost of usage of resources coordinating with suppliers, creating an inter-organizational relation in the value chain. Furthermore, target costing facilitates lean accounting, focusing on creating value for customers with improved functionality and quality of the product or services. It integrates time-driven activity costing as the service or product cost in unit level can be calculated and flexed using TD-ABC tools as long as the rate does not reach that customer would like to pay for the value of the product or service.

4.3.2 Application of Time Driven ABC

Since the case company is human resource intensive, the overhead is allocated based on the capacity hours of frontline resources. Standard capacity hours per day is 7.5 hours thus the weekly hours is 37.5 hours, thus the monthly hours is 150 hours and yearly hours is 1800 per employee. Therefore, the yearly minutes per full-time employees are 108,000 minutes. The difference between TDABC and the practice was found when it is being observed that the time is recorded as hours instead of minutes. The process time has to be estimated for each of the activities within the workflow. All the direct cost of resources is identified and directly charged to cost objects (roles) while estimating a rate card for customers. Resource costs are taken out from operating cost budget. Subsequently, capacity cost rate calculated following ‘time equation’ given the frontline employee hours as a base to allocate the overhead, which the case company termed as ‘multiplier.’ Indirect costs assigned to different roles are also calculated. That is how the rate per minute of different roles can be obtained. From the theoretical point of view, Monroy, Nasiri and Peláez (2012) state that TD-ABC analyses the capacity of each process and the costs for their performance, which makes it close to the lean accounting principles by putting the costs in its value stream.

TD ABC statement of cost per role per munits

Activities	Cost Driver (Quantity)	Unit time	Total Time	Capacity cost Rate	Total Cost Assigned
Creative	8	108,000	864,000	0.07	56,160
Production	5	108,000	540,000	0.06	29,700
Quality Check	2	108,000	216,000	0.06	11,880
Order handling and Delivery	15	108,000	1,620,000	0.06	99,540
Purchase from Graphic People	150	108,000	16,200,000	0.03	480,000
Purchase from SoftwarePeople	30	108,000	3,240,000	0.04	120,000
Indirect costs (fixed production overhead)	30	108,000	3,240,000	0.04	131,520
Total capacity used			3,240,000		928,800
Total capacity Supplied	30	97,200	2,916,000	0.04	915,648
Unused capacity			324,000		13,152

Table 3: TD-ABC statement

Application of TD-ABC is found when project managers report log sheet to report utilization of resource capacity at actuals reflecting the performance of an operation. Martin, CFO says “over-burn or under-burn is usually minor which is tolerable when it does not go beyond 10% of estimated capacity budgeted.” Moreover, client profitability is calculated by finance team, but this reporting does not follow the principles of ABC costing. At the time of customer profitability allocation of overhead is based on direct resource cost rather than time equation, which reflects the lack of coordination between operations and the finance team.

TD-ABC contributes in the optimization of resource capacity as the capability of resources monitored in the execution of activities within the process at actual by utilization rate compared with the budget in unit level as well as in value stream level (Monroy, Nasiri & Peláez, 2012). Therefore, management can diagnose the reason of unused capacity within the process map and take improvement actions to reduce the wastage of resources. Kaplan (2014) argues that this tool can directly attribute most of the indirect resource cost such as depreciation of equipment, facility, support costs to cost objects such as services, customer, products which will help in avoiding elimination distorted overhead allocation of traditional accounting. TD-ABC can be linked with JIT as in this stage the process time is calculated, which can implement the ‘pull’ system by calculating the lead time in the supply chain, when the customer order triggers.

4.3.3 Application of Just in Time

In Japanese perspective, just in time (JIT) is considered as a production management system in which materials, people and equipment are interrelated but in the United States, JIT is focused on inventory or supply chain management (Davy et al., 1992). In our theoretical framework, we take into account JIT as management control techniques. JIT undertakes a set of programs with the philosophy, where the operation runs based on a customer demand reducing waste and improve speed while maintaining the quality leading to optimizing the utilization of resources throughout the process in real time. We tested JIT in the case company situation and found following results:

Since AdPeople A/S produce services, material and inventory are not present to be controlled with JIT approach in ADPeople. However, the main input into the process of value creation is the human resources. In line with the principle of JIT, front-line employees are being hired in agreement with customer's demand forecast, based on the constant meeting with the client. In the year ahead, a discussion with the customer's officials determined the number of retainers (full-time employees - FTEs), based on the requirement of clients' (Dell's) marketing budget.

The customer requirement triggers the resources requirement that reflects on a budget of AdPeople. The quarterly purchase order is being issued by specifying different roles for the certain numbers of FTEs. Further, based on the scope of projects, the quarterly purchase orders are laid out to the productions hubs at Dhaka. At the same time, the Copenhagen team coordinates a project management and a creative phase, acting as a mediator between the supply chain and the customer demand. Besides, the allocated time is registered in the workbook. Thus it can show the percentage

of completion, compared to the process time as the process time determined at the TD-ABC stage. Thus, the workbook summarizes the TD-ABC, JIT and lean accounting principles by identifying the costs capacity of the orders in the time framework, making their analysis and decreasing operational and human costs, which is completely similar to the thoughts of Clinton and Hsu (1997) and Ofileanu (2015).

The delivery on time is ensured with cloud servers, where Dell uploads the production briefing with all the instruction and deadline of the delivery. When AdPeople develops the media sample and uploads it to the cloud server, so that Graphic People can download the media file, to make a production plan and to schedule delivery as per. Thus, JIT facilitates real-time visualization of a progress of orders on the shop floor or production floor giving the controller increased engagement in the manufacturing process. This idea of visualization was also supported in theory by Monroy, Nasiri and Peláez (2012), the scientist stated the visual performance might be used in the control production process by applying measurement tools or a box score so that combining the JIT and lean accounting, which will improve the performance.

The quality is constantly checked by the Quality Engineer and the optimization of resource utilization are evaluated by project managers and global financial analysts, who report to a client accordingly.

The company's average process time, employee engagement, on time delivery, first pass quality is calculated and presented for implementing the continuous improvement, which can be seen in the JIT monitoring report. This information can be summarized in Balanced Scorecard, and finally into the lean accounting box score card. In theory, the idea of implementation of the BSC with the JIT was supported by Souissi and Ito (2004), who noted the BSC makes an entity balancing between the crucial elements such as costs, quality or functionality and lead time. That is also supported the thoughts of Benson (1986) about the just in time techniques' flexibility, simplicity, and holistic approach.

Just In Time (JIT) Monitoring - Year to date (YTD)				Estimated	Actual				
Customer Order	Customer	Job Name	Quantity Ordered	Process time (Days)	Actual production time (Days)	Capacity usage	Delivery status	Quality	Stage
A	J	Software	80	80	16	20%		1st Pass	Order received
B	J	Software	250	250	120	48%		1st Pass	Creative
C	T	Web	65	52	51	98%	On-time	2nd Pass	Delivered
X	D	Web	500	400	586	147%	On-time	1st Pass	Delivered
Y	D	Graphic	60	28	34	121%	Late	2nd Pass	Quality
Z	D	Web	100	80	80	100%	On-time	1st Pass	Invoiced
Total			1055	890	886				

JIT Control	Indicators		
Value Stream	GP	SP	AdP
Office capacity (Sq. Feet)	18000	6000	10000
Used capacity (Sq. Feet)	15000	5000	5000
Unused capacity (Sq. Feet)	3000	1000	5000
On time delivery rate	75%		
Order to Invoice days	0,84		
First Pass Quality	67%		
Cost of poor quality	43	0	0
Employee engagement			
Utilization rate %	100%	80%	90%

Table 4: Just in time statement

4.3.4 Application of Lean Accounting Income Statement

The lean management, to some extent, is practiced in the case company without any systematic link with TC, TD-ABC and BSC. A Chris, CEO, AdPeople A/S explained the value stream analysis is conducted using the business intelligence tool called 'Tableau'. JIT philosophy is reflected in cloud-based platform "Dell-share" that store knowledge assets and focus customer satisfactions and on time delivery. The partial implication of the TDABC is found as capacity utilization is monitored taking data from the workbook. After applying the lean accounting, integrating TD-ABC, TC, JIT and BSC in the context of case company, we have found the income statement can present improved visibility of the resource usage through the value chain in a simple table. The value stream income statement facilitates managers to monitor the performance of particular value stream showing the return on sales contributed by each value stream on overall return of the organization (DeBusk, 2015). That is how it identifies the low performing value stream indicating the area of focus needed for improvement action to accelerate the contribution of the concerned value stream. DeBusk (2015) argues overproduction is the reason of lower profit as costs are increased without a corresponding increase in sales thus the management may optimize process with control action by inventory reduction, increased employee engagement, minimizing waste of resources, eliminating redundant transactions and non-value added activities.

WEEKLY LEAN ACCOUNTING INCOME STATEMENT				
Process	VALUE STREAM			TOTAL Amount
	GP	SP	AdPeople	
Sales	1200	300	1000	2500
Customer order handling	-	-	160	160
Client, agency and creative briefing	-	-	31	31
Creative concept and layout development	-	-	220	220
Application Development	-	206	-	206
Regionalization and localization	90	-	-	90
Production and Quality Assurance	743	81	-	824
Delivery of orders	25	-	93	118
Evaluation and reporting	140	-	280	420
Value stream profit	202	13	216	431
Return on Sales (ROS)	17%	4%	22%	17%
Headcount	150	30	30	210
			Unallocated occupancy cost	65
			Exchange rate adjustment	40
			Un allocated overhead	116
			Total profit	210
			Total ROS	8%

Table 5: Weekly lean accounting income statement

Baggaley (2007) shows how customer needs, technology changes and stakeholders needs generate corporate strategy transforming through strategic business units (SBU) to the value stream goals. This same process of injecting strategy of WPP into the case company can be found as Jose, VP of Wunderman explained how strategy translates into the local units. In our testing of framework balanced scorecard used mapping this process. Subsequently, value stream goals are monitored through the measurement of performance on lean accounting income statement which drives the continuous improvement. According to Martin, CFO, Wunderman describes how he with his CEO implement continuous improvement in operational and functional level by adopting a functional strategic change on an ongoing basis through interactive controls (Simons, 2013). Value stream box score is the tool to follow up the result of these improvement actions to visualize in live the weekly outcome of functional strategies.

4.3.5 Application of Balanced Scorecard

Balanced scorecard generates performance measurement indicators from the lean accounting process. Most of the measures can be found in the box score of lean accounting report which measures and map the value stream. Moreover, the box score is the output of JIT, TC, TD/ABC which justify the integration of balanced scorecard in lean accounting. Another possible application of the BSC is to clarify the strategy and identify the essential initiatives when allocating resources and set priorities (Giannopoulos et al., 2013). In the case company, the BSC is used to make the strategy throughout the process, so that strategic priority can be linked with the various aspects of the dimension of performance in a value chain. When balanced scorecard is implemented together with other tools, the strategy mapping, decision making and visibility of value stream performance would be smoother. Moreover, improvement initiative to attain strategic objective for optimizing utilization of resources would also be easier. Therefore, the indicators empower management what action to be taken to create value for customers and employees. However, in the case company context, we observed the output of traditional accounting process is also necessary to be integrated to map the strategic performance in full fledge. Besides, some key performance indicators (KPIs) are the result of a process of human resource departments such as employee engagement indexes and the result of a report from marketing department in case BSC incorporate customer satisfaction index. However, when all module of the value chain is put in place in ERP, the result will go in live on board automatically. Kaplan and Norton (1996b) state that company can also use BSC to help communicate strategy throughout the enterprise, then conduct periodic performances reviews to monitor and make adjustments. In this regard, if things go wrong, the variations in the indicators trigger the interaction thus discussion intensified and trouble fixed with improved coordination and dialogues among managers of different departments.

Balanced Scorecard

PERFORMANCE MEASURES	Benchmark	GP	SP	AdP	Value Stream Total	Deviation
CUSTOMER						
On-time delivery	100%				75%	-25%
Customer satisfaction	100%				-	
Order to invoice in days	0,5				0,8	0,34
Improvement in staff costs/revenue pre-incentives	0,60%				-	
FINANCIAL						
Operating profit growth (%) / Return on revenue	10-15%				8%	-1,60%
Average production cost per hour	200				262,77	(62,77)
Salary growth at no more than 75% of the growth in revenue	75%				-	
ROI	15%				-	
INTERNAL PROCESS						
Utilization rate	90%				84%	-5,59%
Employee engagement					-	
Revenue conversion of between 25% and one-third; / AR Aging	25%-33%				0	
Cash operating cycle					-	
LEARNING AND GROWTH						
Sales growth	20%				0	
% revenue from new service	20%				0	
Improvement in operating margins	1%				0	
First Pass Quality (%)	90%				67%	-23,33%

Table 6: Balanced scorecard

4.3.6 Value Stream Box Score

Box score presents operational, resources capacity and financial measures in three separate part which are considered key driver for optimization of value. We can presume the box score can empower management and employee to take effective decision to improve the future state of the value stream to create value for the customer. Woehrle and Abou-Shady (2010) support the fact that the value stream box score can be the tool to make a bridge between shop floor of operation and financial statement of finance and accounting departments. Our empirical findings indicate that the some of the important non-financial operational measures of balanced scorecard can be linked to the box score. Cunningham and Fiume (2003) recommend that the measures should be few non-financial operational leading indicators that measure process not the people prioritizing the improvement initiatives in line with the strategy of the company. The box score can be posted in production floor in the LED display structured in a frame to motivate the right behavior (Woehrle & Abou-Shady, 2010).

Lean accounting income statement calculated the return on sales of 17 %. However, in the case company context to earn 10 % margin company's value stream return on sales (ROS) has to be 20%. Thus, the box score shows 3 % hurdle rate, which is the targeted optimization rate for planned improvement. The Box score is also used to monitor the result of the action plan on a weekly basis to attain the future state (FS) (Maskell & Kennedy, 2007). It can also be used for simulation in the spreadsheet to see the impact of investment in capital assets or in the case of any changes incurred in operation, what is the effect from other dimensions.

WEEKLY BOX SCORE for VALUE STREAM MAPPING

Monthly Numbers	Measures	CURRENT STATE	PLANNED IMPROVEMENT	FUTURE STATE	Week1	Week2	Week3	Week4
Operational Value Stream Performance Measurements	Productivity (Amount/headcount)	12	0	12				
	On Time Delivery	75%	0	1				
	Order to invoice hours (per unit per men)	6	0	6				
	First Pass Quality	67%	2%	69%				
	Average Product Cost	263	7,25	270				
	AP days-AR days	N/A	N/A	N/A				
	Employee engagement in Lean	N/A	N/A	N/A				
Value Stream Capacity	Utilization rate / Productive time %	84%	2,53%	86,95%				
	Unused capacity / Non-productive time %	16%	0,47%	16,05%				
	Available Time	15%	0,45%	15,61%				
Value Stream Financials	REVENUE	2500	75	2.575				
	Materials Costs	284	9	293				
	Front-line staffs Costs	1.351	41	1.391				
	Conversion Costs/Machine Costs	434	13	447				
	Inventory	N/A	N/A	N/A				
	Value stream profit	431	13	444				
	Return on Revenue	17%	3%	20%				
20%	Hurdle Rate	-3%	3%	0%				

Table 7: Weekly box score for value stream mapping

The value stream box score report shows the final outcome directing the areas to optimize the utilization of resources for creating 3% increased return for the entity. Moreover,

By applying the framework, we come up with results for the case company, which are summarized as follows:

Trained employees will likely to make customers more satisfied with the service and products that will lead to a possible rise in sales and an increase of a market share (Schlesinger and Heskett, 1991). The additional training will let the employees improve the effectiveness of the performance and respond to the problems quickly.

Standardization and simplification. The experienced and proactive employee hold the tacit knowledge, which is vital in standardization and simplification of projects which can influence the quality and speed, referring to the JIT techniques and lean accounting (Monroy, Nasiri & Peláez, 2012; Filippini & Forza, 2016). Therefore, the company may benefit from improving employee retention reducing employee turnover rate.

The case company may introduce the Electronic Data Identification (EDI) in amplifying the JIT approach to automating the receipt of the scope of work, purchase orders, briefing, payment instructions from the customer. EDI will make sure on time and efficient way of exchanging purchase orders to suppliers, receipt of invoice and payment to vendors.

Instead of using two separate ERP, Workbook and Navision the process would be more efficient when just one ERP can integrate whole value chain, project management, and financial reporting.

Coordination. According to Canel, Rosen and Anderson (2000), by locating the departments near to each other, there will be easier and quicker to get the response from other divisions and create better information flow. By reducing the communicational barriers, solutions will be found faster that will influence the quality and time of the delivery process. The communication barriers may be decreased both by the closeness of the physical layout between the departments, as well as modern communicational tools.

Standard lead time. Case company may measure the value chain lead time with a careful observation by measuring the metrics to determine how much time each activity consume in producing and delivering different services by size considering the degree of complexity. So in general view, it was supported by Kaplan (2014) and Monroy, Nasiri and Peláez (2012) the academics agreed that TD-ABC, lean accounting and JIT approach emphasize the time costs belonged to each activity.

Performance measure. With the help of marketing survey, the company may compare the lead time, quality and rate per of different services with competitors and set benchmark for monitoring. The TC and BSC comparison may also be applicable to compare the core costs in service firm and to designate cost, quality and time concerning the BSC development (Souissi & Ito, 2004).

The case company may improve bottom line optimizing the resource utilization by not just monitoring and controlling the human resource, but identifying the unused capacity of other resources such as property, plant, and equipment.

To conclude, we may agree with Kennedy and Maskell (2007) and, Monroy, Nasiri and Peláez (2012) about that the lean philosophy serves a basis for the combination of different new accounting techniques. The main direction to the optimizing utilization of resources attained using the visual management and target costing which allows the company to estimate the allowable cost and the demand while not losing in the lead time. TD-ABC correctly corresponds to the value stream management goals and JIT facilitates continuous improvement principle of lean accounting using the box card (Maskell & Baggaley, 2006). As KPIs of balanced scorecard can be connected to the box score, the strategic objectives can be translated into the management of resources.

4.4 Optimizing utilization of resource capacity

It is being observed that there is subtle connection among TC+TDABC+JIT+BSC, which follows through the value chain, making the principles of lean accounting comes into being in practice. The income statement of lean accounting visualizes the performance of processes around the value stream indicating the returns on sales. This return on sales summarized in box score reflecting the key drivers of improvement initiative that management needs to take into consideration if there is any negative hurdle rate. Hurdle rates indicate the percentage of return on revenues that an organization needs to achieve to match the targeted margin. That is possible when waste is minimized, costs of rework are reduced, with improved employee engagement, on time delivery, customer satisfaction. Multa & Cunha (2011) explain the desired return is possible by maximum use of the capacity of resources, for example, the factory needs to be operated at full capacity with the full use of warehouse space by reducing inventories, utilizing the full capacity of employees by controlling unused capacity. Machines are needed to be running without trouble and downtime. Processes required to be optimized in compatible to the convenience of material flow following the roles of frontline staffs that fit with the layout in sequence to the stage of production that pull the customer demand and requirements of a value of the functionality of products or services the process deliver.

Kaplan (2014) in his article shows how TD-ABC pilot projects help healthcare organizations to provide patient value at lower costs by monitoring expenses in the specific activities mapping processes. He also found that combining TD-ABC with other measurement tools illuminates the area of improvements identifying the scope to redesign the processes.

As the framework tested, it shows how the customer's value driven organizations can reach to the targeted margin adopting target costing linking the time-driven ABC and then monitoring the progress of production with JIT principle checking the lead time of each stage of the processes that is being calculated at the time of TD-ABC step. JIT produces real-time metrics of quality, production status, etc. recording process data into ERP focusing on time delivery and following customer's orders. Subsequently, these metrics feeds in forming KPIs of BSC dashboard which is also connected to box score. Meanwhile, income statement illustrates value stream and process wise performance from the database and that is also linked to the box score. Box score then acts as a decision-making tool. The linkage of TC+TDABC+JIT+BSC forming the lean accounting presents below:

The changes of management accounting techniques need to be in line with the changes to the manufacturing process. Clinton and Hsu (1997) explain as changing the production process in a radical way without changing the management controls system creates goal incongruence, inconsistency in performance evaluation and dysfunctional behaviors. In case the organization adopted the lean management and lean manufacturing philosophy focusing customers, empowering employees, reducing inventory, etc. only then the proposed framework of integrated

TC+TDABC+JIT+BSC can provide a useful result. And, that must be supported by customization of the ERP so that the system can capture primary and support activities across the value chain taking advantage of information technology through automation and integration.

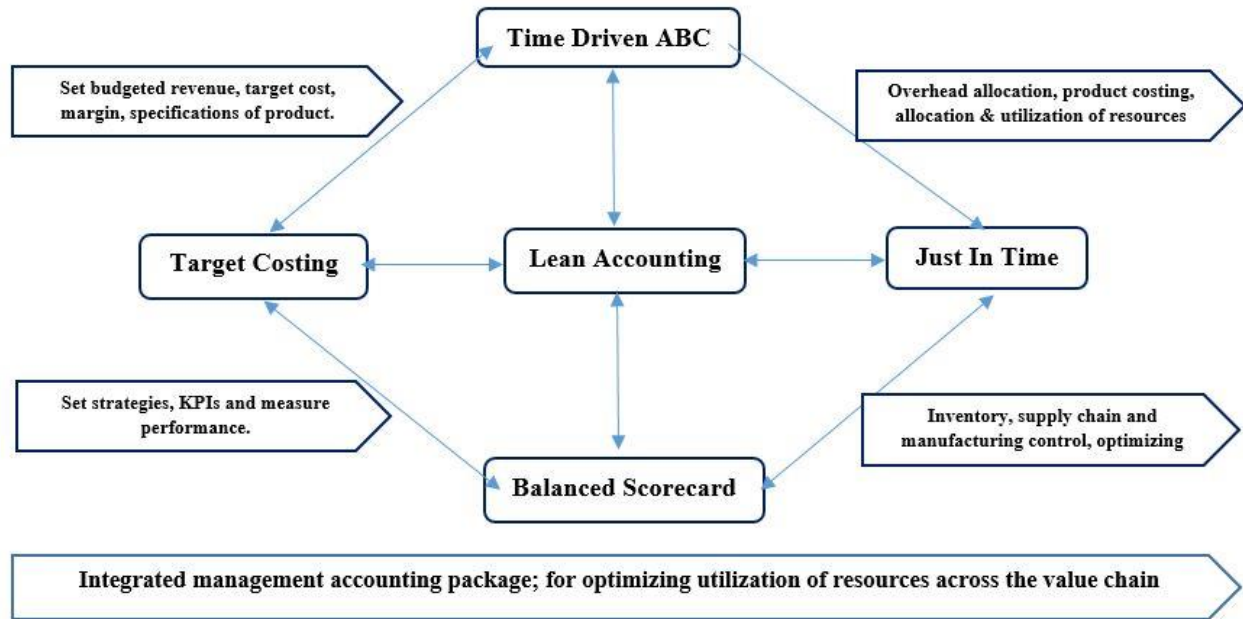


Figure 10: Implementing lean accounting integrating TC+TDABC+JIT+BSC

4.5 Implication of management control in management accounting in the case company

A series of fluctuations from 2005 to 2016 has led to a drop in the revenue, the amount of USD 11m was reported in the year of 2005 when the sum in USD 8m was stated in the year of 2016 (Appendix 11).

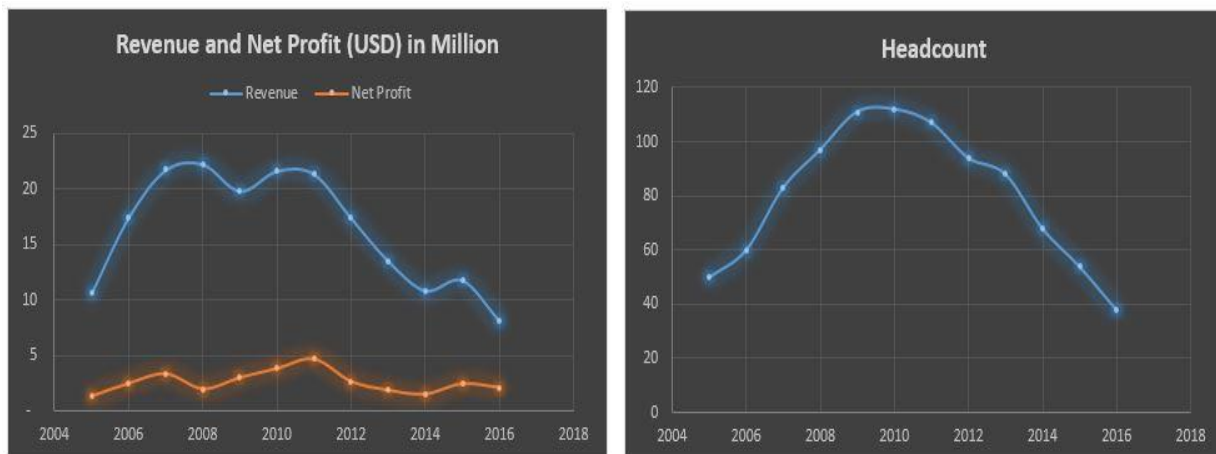


Figure 11: Graph showing implication of MCS on revenue, profit and headcount trends of AdPeople A/S

The illustration above indicates the revenue rate during 12 years by starting from 2004 and till the forecast for 2018, including the headcount and profit relationships. The revenue and a headcount experienced almost in the same direction. On the other hand, the profit line is relatively flat in compared to the curve of revenue. The reason is that the strategy formulation, management accounting and financial decision of AdPeople was controlled by the WPP Inc. from 2007. It was focused mainly on tight control on the bottom line, introducing new practices in reporting requirements especially employing cybernetic control which ensured the stability of profit margin even though the revenue and the headcount declined sharply. Besides, during the time the management gained efficiency and adapted strategically to the change of a business structure, installing the innovative technology in place to lean the operations and continuously improve the operational effectiveness. The customer constant put pressure to optimize the resource capacity by enhancing the utilization rate. By controlling cost, AdPeople can contribute to the client's needs to remain within their budget scope and the approved rate.

The empirical study demonstrates in what way the management accounting methods support each other in a systematic flow in directing the best possible way to use resources. For instances, target costing takes in the rates per units of product or services calculated with time driven ABC which contribute as foundation for forming budget following the strategic priorities and customer requirements. Subsequently, JIT principles can be reflected in controlling the supply chain and manufacturing management linking the TD-ABC data that to process time. This turnover time can be used to monitor the lead time for pulling supplies, throughput time and on time delivery to customers. Non-financial measures relate to quality, employee engagement from Balanced scorecard also can be linked in JIT monitoring. the TD-ABC techniques, database capturing the actual manufacturing records with JIT principles can be used to calculate lean accounting income statement. Finally balances scorecard data can be used to form the value stream box score which directs improvement initiative to attain optimum use of resources. In the case company context, the revenue and profit relationship compared to point out how the management control system facilitate accounting system in creating and maintaining bottom line in turbulent operating environment. Therefore, the study established not only the linkage among the modern management accounting techniques but also it shows how important for management accounting system to be supported by management control system.

5. Analysis and Discussion

The technological upgradations, globalization made the production process competitive and a business process more complicated. More and more merger, acquisition, vertical integration taking place as a result of strategic initiatives. After the 1980s, management and production process of organizations are adopting lean manufacturing process to survive in the competitive market (Ofileanu, 2015). However, the research shows that the accounting process still depends on the traditional bureaucratic and mechanistic culture. Thereby, the traditional accounting systems doesn't longer cope up with an organic culture, where continuous improvements initiative focuses on the value creation for customers with the effort of empowered frontline staffs.

Moreover, our investigation reveals that in spite of fierce criticism of traditional accounting by academicians (Kaplan and Anderson, 2013), the practitioners still relies on the conventional accounting system. That is because the accounting databases or general ledgers are based on regulatory requirement, IFRS and GAAP, which produce reports for financial accounting to serve the purpose mainly for shareholders and government agencies. Simultaneously, the same database is used for the management accounting system, which led to supply the decision making the demand to optimize resource capacity through the value chain by management and employees (Hsu, 2013). When the objectives are different for two accounting systems, then the management accounting system suffers limitations that rely on the data of financial accounting system. Thus, contemporary modern accounting tools emerge from limitations of the traditional accounting through the research by scholars of an accounting discipline.

This paper analyses literatures in the development of our theoretical framework elaborated the discussion and connection of the four elements of cybernetic control following the framework of Malmi and Brown, 2008. In this respect, our framework suggests integrated application of management accounting tools that can capture the end to end value creation process of a value chain. For example, target costing and time-driven activity based costing can calculate the product cost, process time, forecast revenue, allocate resources and guide profitable product mix and customer segmentation or domain choice which can form the foundation of budgets (Monroy, Nasiri and Peláez, 2012). Just in time can monitor and control the supply chain, inventory level, production process, lead time, on-time delivery, employee engagement and quality issues in line with the lean thinking. The JIT empowers management and front line staffs at the same time capturing and displaying the non-financial measures directing the futuristic actions. Whereas Lean Accounting P&L is linking the TD-ABC produces financial measures at actual. Lean accounting income statement and balanced scorecard can visualize the full value stream performance linking the strategic priority facilitating to take improvement actions for optimum consumption of resources (Souissi and Ito, 2004). Moreover, Value Stream box score linking the measures of BSC and Lean P&L attain the hybrid measurement system guiding improvement initiative for capacity optimization by increasing utilization rate (Maskell & Baggaley, 2006). Therefore, a systematic linkage observed among TC, TD-ABC, JIT, BSC and lean accounting.

Cybernetic Control			
Budgets - Target costing - TD ABC	Financial measurement system - Lean accounting income statement - TD ABC	Non Financial Measurement system - Just in time control report	Hybrid Measurement system - Balanced scorecard - Value stream box score

Figure 12: The integration of management accounting techniques within cybernetic control
Source: Extract of framework of Malmi and Brown (2008)

The fundamental concept is estimated that a customer's value is created alongside optimizing the utilization of resources then the value stream will automatically create value for other stakeholders in concern as the bottom line improved over time (Medeiros, Santana & Guimarães, 2017). We emphasized on integrated use of modern management accounting tools as these will systematically process value chain performance data from product costing to an analysis of value stream profit and customer profitability. The framework does not rule out the traditional accounting system as the company needs to prepare statutory reports and meet the reporting requirements for the external purpose. The framework of integrated use of modern accounting techniques would look for additional financial and non-financial data based on the strategic objectives which are flexible enough to customize the existing ERP. The finding suggests implementing the new system on top of the traditional accounting system. The matter is that the additional process data will empower a controller to analyse the value stream performance, customer profitability, product profitability, key performance indexes to attain strategic objectives to optimize usage of resource capacity closely coordinating with R&D, operation and marketing managers. The effectiveness and efficiency of the proposed framework depend on the strategy of the organization, stakeholder salience, risk management, improved automation and integration, decision-making capacity and system thinking approach around management control system (Hsu, 2013).

The JIT part of the theory will cause a serious problem if the risks are not adequately managed due to unavailability of the raw material inventory for entities depended on raw materials in the seasonal variation. Also, the machine and equipment are complicated to configure in a case of the troubles happen. Further, the customer demand for finished products is volatile (Hutchinson & Liao, 2009).

Those companies whose fixed production overhead is not significant then an implementation of the TD-ABC may not be very much relevant. Even though the ABC became the most popular product, then the costing system, lean organizations have rejected it altogether (Hutchinson & Liao, 2009). However, TD-ABC brought back the hype, being compatible to lean management. According to Hutchinson and Liao (2009), Japanese management accountants directly charge overhead to the product line, thereby the overhead remains insignificant, which do not affect the product costing.

The ABC technique is not accepted accounting principle (GAAP), which means the company that needs to take a benefit from the ABC must develop another type of the costing system in addition to the traditional system. As a result, some companies may not adopt the framework as they might feel that they have enough to do without working through two costing methods (Skousen & Walther, 2010).

The theoretical framework that we proposed cannot rule out the importance of the traditional accounting, as a company has to prepare the statutory external financial statement and to follow the standard and compliance set for preparing financial statements. Besides, the attempt to implement this framework in small service organization with a little customer base and solid product mix may be irrelevant as it needs the additional effort on the top of the general accounting, which perhaps becomes enough to justify the performance of a product and its process to optimize the resource usage. Furthermore, without integration and automation of the contemporary management accounting tools it can be more expensive and redundant, thereby the practices may get obsoleted eventually.

5.1 Limitation

The framework outlined in this paper is more relevant for medium to large size organizations, where detailed production process is prevalent. The framework may not be applicable to those organizations that are not operating in a perfectly competitive market. In case the company possesses a dominant role (monopoly) at the market having the power to decide price and control the choice (demand) of customers, then the proposed framework might be less effective. The adoption of the given framework depends upon the discretion of the top management in the group of companies in the bureaucratic, hierarchical structure since they hold the authority to design the system structure based on their strategic initiative. Nevertheless, a manager or a controller of a local company or its branch or a subsidiary implement the policy, procedure, and directives in the top-down organizational structure having no control over designing management control system, management accounting system and performance measurement system (Medeiros, Santana & Guimarães, 2017). Thereby our framework inspired by an organic culture as well as influence the lateral channel of coordination, where the value is driven by prioritizing customers first may be useless in mechanistic culture. Moreover, the design of management accounting system must follow the manufacturing process and the management control system. Thus, if the organisation's operations do not follow the principles of lean manufacturing and lean management then this integrated management accounting system will have no relevance. Rather it might cause goal incongruence and dysfunctional behaviors within cross-functional departments.

The result of testing of our proposed framework at the case company shows that the integrated contemporary management accounting tools can be applied independently to measure the performance of a value stream. However, whether the framework would facilitate management in

optimizing utilization of resources is depend upon testing the system in a long-term observation. But based on the evaluation of secondary empirical data, it indicates that the integrated use of management accounting tools enhances the bottom line.

5.2 Contribution

In the recent studies on management accounting, academicians revealed many shortcomings and inefficiencies of traditional accounting. In the paper, we synthesized the major limitations of traditional accounting and then reviewed the literature focusing the emerging development in management accounting that addressed discussions specific to those problem areas. First, our effort was to revisit the underlying construct of those modern management accounting techniques to explore the possibility to connect them with each other according to the objective to eliminate the distortions of traditional accounting. It was found that in case those emerging techniques can be employed in an integrated manner, then significant limitations can be avoided. It is summarized how the limitations can be resolved in Appendix 3. In this regard, our contribution in specific is to show the way how the controller can put the production floor's performance picture in the corporate board room.

Subsequently, the cybernetic control part of the framework of Malmi and Brown (2008) was developed by connecting TC+TDABC+JIT+BSC in a package constructing lean accounting. This is the major contribution of this paper as it links the budget, financial and non-financial measures as well as hybrid measures in a chain with strongest fit among each other addressing the lean principles. In the empirical analysis, we find a systematic linkage among TC+TDABC+JIT+BSC. The combined application of modern methods has made it possible to put a synergy effect in resolving the distortion of traditional accounting. Moreover, integrated use of these techniques facilitate in designing the construction of lean accounting.

Japanese management accounting established the base for lean manufacturing through TPS incorporating target costing and just in time manufacturing techniques in the 1980s. However, popular developments in the USA, for instances ABC and balanced scorecard were considered to be not compatible to lean accounting. Despite the fact, with the modified version of ABC to the emergence of time-driven ABC, a few research based on case studies have examined a linkage between TDABC and BSC with lean accounting. Nevertheless, we have not found any academicians yet, who combined the four tools all together in a package within the lean accounting. In our paper, we show a systematic linkage by designing a framework of the integrated management accounting system to implement lean accounting, based on a single case study expanding cybernetic control in details.

During the process of integration of TC+TDABC+JIT+BSC, the implications of management control system, integration and automation of information technology was emphasized in attaining a full benefit from integrated management accounting. Those elements act as an essential

foundation or building blocks for accounting tools in optimizing the usage of resources capacity. After the management accounting techniques can be integrated into a package with the support of surrounding environment, then the lean accounting can direct continuous improvement, which in turn will generate tremendous value for an organization, as it will lead to a reduction of costs through the optimized process and the increase of returns by satisfied customers.

6. Conclusion

The study magnifies the cybernetic controls part of the framework of Malmi and Brown (2008), by elaborating the discussion to resolve the limitations of traditional accounting practices with the combination of modern accounting techniques in a package. Baggaley (2007) argues that the traditional performance measures work against lean progress in a lean management. Since some regular practices of accounting are no longer commensurate to the contemporary lean manufacturing environment, the emerging techniques come in place. That is to eliminate ineffective practices and to make sure those modern accounting practices are relevant to support lean manufacturing. The proposed framework was inspired by system thinking theory and value chain management to build a business model that prioritize customer first. This paper demonstrates the integration and application of management accounting methods in case company process through the in-depth understanding of the underlying construct of that development with the study of the publication related to the theme. The study interprets and categorizes the relationship among cost accounting methods when applied in the lean production model. The integrated management accounting system within the framework connects JIT+TC+TDABC+BSC together to build lean accounting in a package. The study also pointed out the efficiency of management accounting system depends upon the flexibility of customizing database in ERP as required by strategic objectives of the organization in concern. The integrated management accounting techniques in a package show the systematic way to capture the performance of value chain with the support of MCS. Resource utilization is optimized once the lean concept in accounting maximizes customer value by reducing waste, lead time, inventories and eliminating non-value added activities and process re-configuration as a result of continuous improvement initiative (Multá & Cunha, 2011). This integrated management accounting package eventually create synergy effect, which in turn ensure optimum use of the capacity of resources to improve the bottom line.

6.1 Future research scope

During the literature review, it is being observed that a limited number of recent research papers are available especially when it comes to integrating TDABC and BSC with lean accounting. The possibility to put the TC+TDABC+JIT+BSC into a package detailing the cybernetic control of management control package are rarely explored even though our study found a systematic linkage among each other. Most of the papers relate to management accounting, or cost accounting studied theorizing and analyzing the superiority of modern developments solely in comparing to the traditional system showing the possibility of the way to cost reduction or waste identification or process reconfiguration (Medeiros, Santana & Guimarães, 2017). There is a scope to search further to explore the relationship of lean principles with the cost accounting techniques in the process of value creation connecting the value stream to provide valuable insight for continuous improvement, time and process management by creating increased engagement of controllers in guiding operations, marketing and R&D managers. Finally, this study may serve as a source of research and the reference for future studies on integrated reporting <IR> and sustainable lean accounting.

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8. Appendix

Appendix # 1: Differences between inductive and deductive approach of research

Nature	Inductive approach	Deductive approach
Direction: (Trochim, 2006)	Moving from the specific to the general	Begins with the general and ends with the specific
Style of work: (Clark, 2007)	Referred as 'cause and effect reasoning' "bottom-up, using the participants' views to build broader themes and generate a theory interconnecting the themes"	Works from the 'top down', from a theory to hypotheses to data to add to or contradict the theory"
Types of analysis: (Soiferman, 2010)	Qualitative: Induction has also had repercussions in various qualitative method domains	Quantitative: The intent is usually to test theories deductively searching for evidence to either support or to refute the hypothesis.
Judgment: (Heit & Rotello, 2010)	Influenced by quick heuristic processes that tap into associative information about context and similarity that does not necessarily make an argument logically valid.	Heavily influenced by slower analytic processes that encompass more deliberative, and typically more accurate, reasoning.
Validity of Conclusion:	The premises support the conclusion	True premises develop a true and valid conclusion

Appendix # 2: Email with the attachment of ‘interview questionnaires’ to interviewees of the case company

Hi Martin, Chris, Torben, Morten, Jose,

We, Samad, Ymeng and Kateryna, are the students of Lund University going through a master project. The study we wish to undertake in your organization forms a significant part of our thesis paper in the process to accomplish Master degree.

The purpose of the case study is to look at how managers of international companies optimize the capacity utilization of resources across the value chain using management accounting tools. I am interested in discussing the background, process and activities of the organization. And, how your organization measures business unit’s performance in line with the strategic goals coordinating with other business units in the value stream. Discussion agenda attached for your reference.

I anticipate that this would involve a discussion of approximately 30 minutes at a time convenient to you in this week. I would like your permission to tape the discussion and also to take notes during this time. The tapes will be transcribed and the write-ups will be returned to you for checking and confirmation that they represent the discussion which took place. Any information collected which is commercially sensitive will be treated in an appropriate manner and confidentiality will be respected at the utmost.

If you have any questions or queries about the study in the event that you wish to contact our thesis supervisor, his contact details are:

Dr Rolf G Larsson
Ass prof
School of Economics and Management
Lund University, Sweden
phone [+46 46 2224680](tel:+46462224680)

Thank you very much for your help in this regard.

Best regards,
Samad, Yumeng, Kateryna

Questionnaires to interviewees at case company:

1. Would you please tell us something about the history of AdPeople, you and your role in AdPeople?
2. How the strategic objectives, goals and plans are developed for your organisation?
3. How are long-term plans conveyed to staffs and how these plans translated into the daily activities?
4. Would you please discuss the process of AdPeople that start at receiving order from customer to delivery of services to the customer and what are activities involve in each of the process?
5. How other business units such as WPP, Wunderman, Graphic People and Software People involved in the process and activities of your business?
6. What are the implications of accounting system in recording the transaction events throughout the process?
7. Are there any problem or shortcoming you are experiencing with the present accounting system?
8. How budgets are set, how the allocation of resources you decide in budget procedure?
9. Who determine the rate / price – customer or you?
10. How do you calculate rates, estimates cost and price for customers?
11. What are the roles of Graphic People and Software People involved in deciding cost and budget?
12. What basis you use in allocation of overhead, indirect costs, at the time of estimating cost per hour and during calculation of client profitability?
13. How you measure the performance of resources are being used and monitor budget, prices that you quoted to customers are not exceeded?
14. What measures you take to control cost and for risk management?
15. Is there any implication of just-in-time system to deliver the services to the customers?
16. How do you measure the customer's satisfaction?
17. Do you use any dashboard to monitor your KPIs?
18. What are the key performance indicators in measuring the performance?
19. Which ERP, system and business intelligence tools you use to automate and integrate the process within the value stream?
20. Are they fully integrated?

Appendix # 3: Summary showing how the emerging management accounting techniques can resolve the limitation of traditional accounting practices

Sl. No.	Shortcomings identified	Traditional accounting techniques follows	Emerging accounting techniques resolves the limitations as below:
1.	Distorted overhead allocation	Overhead allocation is mainly based on labour hours	Overhead allocation is based on capacity rate of time equations that share the overhead accurately.
2.	Wrong product costs	Standard costing	Time driven activity based costing (TD ABC) justify the accuracy of product costing eliminating unused capacity cost from product cost.
3.	Inventory buffer	Push system	Pull system of Just in time (JIT) supply chain management send purchase orders (POs) to suppliers based on the customer requirements.
4.	Production in large batch	Push system	Pull system of Just in time (JIT) manufacturing management encourage small batches as per the customer demand.
5.	Disconnected departments	More specialized departments	Lean accounting inspires flat organisational structure
6.	Bureaucratic management control	Hierarchical channel of communication	Lean accounting inspires lateral channel of communication
7.	Stakeholder salience	Shareholders and Government are prioritized	Customers, employees and suppliers are prioritized setting JIT and Target costing (TC)
8.	Frontline staffs	Cost control primarily goes through reducing Frontline staff costs	In lean accounting employees are empowered with engaging in continuous improvement, training and incentive scheme
9.	Quality improvements	No non-financial matrices can be retrieved to improve quality issues	Balanced scorecard (BSC) incorporates cause and effect based non-financial leading indicators which directs the action for quality improvement
10.	Competitors performance analysis	Compare internal performance with variance analysis	Implementing BSC, competitor's performance set the benchmark for comparisons

Appendix # 4: Questionnaires for survey

Questionnaires for master's project on Management Accounting best practices

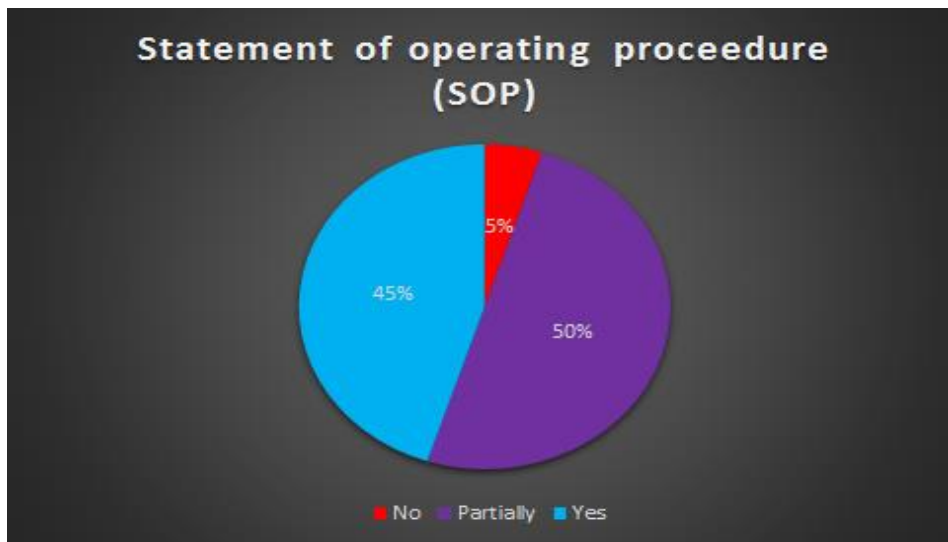
1. Name (optional):
2. Your position:
3. Name of the organisation (optional)
4. Nature of industries:
 - i) Manufacturing
 - ii) Service
5. Country:
6. Number of Employees
 - 1-100
 - 101-500
 - 501-1000
 - 1001-5000
 - 5000+
7. Do your organization codified strategy, policy and procedures in 'Standard Operating Procedures' (SOP)?
 - i) Yes
 - ii) No
 - ii) Partially
 - iv) Under construction
8. Do your ERP integrated supply chain, manufacturing/operations, human resources, sales, customer services activities?
 - i) Yes
 - ii) No
 - ii) Partially
 - iv) We have separate system
9. Have you adopted following management accounting practices?
 - i) Activity Based Costing (ABC) / Time Driven Activity Based Costing (TD-ABC)
 - ii) Target Costing (iii) Just In Time Inventory (JIT) (iv) Lean Accounting (v) Risk Management (with COSO IC / ERM Framework) (vi) SOX Control (vii) Balanced Score Card (viii) Sustainability / Corporate Responsibility / CSR Reporting (ix) Integrated reporting (in Annual report) (x) Business Intelligence (Financial and non-financial analysis) (xi) Break even analysis (xii) Budgeting and forecasting (xiii) Absorption costing (xvi) Variance analysis (xvii) Capital budgeting / Investment / Project appraisal (using NPV/ ARR/ Payback)

10. What are the Key Performance Indicators (KPIs) you are required to report?
11. What is the basis, you apply, in allocation of fixed production overhead?
 - i) Labor hour rate
 - ii) Machine hour rate
 - iii) Material consumption rate
 - iv) Activity Base Costing
12. Which business intelligence tool do you use for presentation of financial analysis?
 - i) Microsoft Excel (ii) Tableau (iii) Qlik (iv) SAP (v) Others
13. Do your accounting system report following?
 - i) Performance of cost centers
 - ii) Performance of process / value chain analysis
 - iii) Client profitability
 - iv) Product profitability
 - v) Consumption of resources by activity
 - vi) Consumption of resources by cost centers
 - vii) Analyse non-financial qualitative data
 - viii) Operational/manufacturing risk
 - ix) Benchmark performance of competitors
14. What are the limitations you have experienced practicing Management accounting? In your opinion how these could be resolved?
15. Please share the most effective cost control mechanisms based on your experience.
16. Please share with us some effective resources allocation techniques as per your experience that optimizes resource utilization capacity.
17. Please share few risks your organization faced and the strategies that you undertake to cover those risks.

Appendix # 5: Respondent’s basic data of survey respondents

Timestamp	Country:	Region:	Your position:	Nature of industries:	Number of Employees
3/22/2017 5:04:33	Engladesh	Asia	Controller	Service	1-100
04-05-2017 10:30	Ukraine	Europe	Chief Financial Officer (CFO)	Manufacturing	1-100
3/24/2017 17:26:13	Brazil	Sounth America	Controller	Service	101-500
3/24/2017 19:24:28	Denmark	Europe	Finance Director	Service	1-100
3/25/2017 22:15:21	Malaysia	Asia	Controller	Service	501-1000
3/27/2017 18:43:37	Japan	Asia	Finance Manager	Manufacturing	101-500
3/27/2017 22:41:29	China	Asia	Finance Director	Service	501-1000
3/29/2017 20:56:13	USA	North America	Controller	Service	101-500
3/30/2017 10:55:55	Italy	Europe	Controller	Service	1-100
3/30/2017 11:13:59	Bangladesh	Asia	Finance Manager	Service	1001-5000
3/30/2017 15:44:25	Tanzania	Africa	Controller	Service	1001-5000
04-01-2017 09:59	Sri Lanka	Asia	Controller	Service	101-500
04-05-2017 12:39	Ukraine	Europe	Finance Director	Service	1-100
04-05-2017 21:51	China	Asia	Controller	Service	1-100
04-06-2017 19:29	Ukraine	Europe	Controller	Service	1-100
March 27, 2017 12:19:14 AM	Bangladesh	Asia	Finance Manager	Service	101-500
March 27, 2017 10:47:05 AM	Bangladesh	Asia	Assistant Manager	Service	1001-5000
March 27, 2017 3:41:54 PM	Bangladesh	Asia	Manager & Head of accounts	Manufacturing	5000+
March 30, 2017 5:48:02 AM	Bangladesh	Asia	AGM- Accounts & Finance	Manufacturing	1001-5000
4/19/2017 5:06:00	Mexico	North America	Controller	Service	101-500

Appendix #6: Trend of codified strategy, policy and procedures in 'Standard Operating Procedures' (SOP) - 20 responses



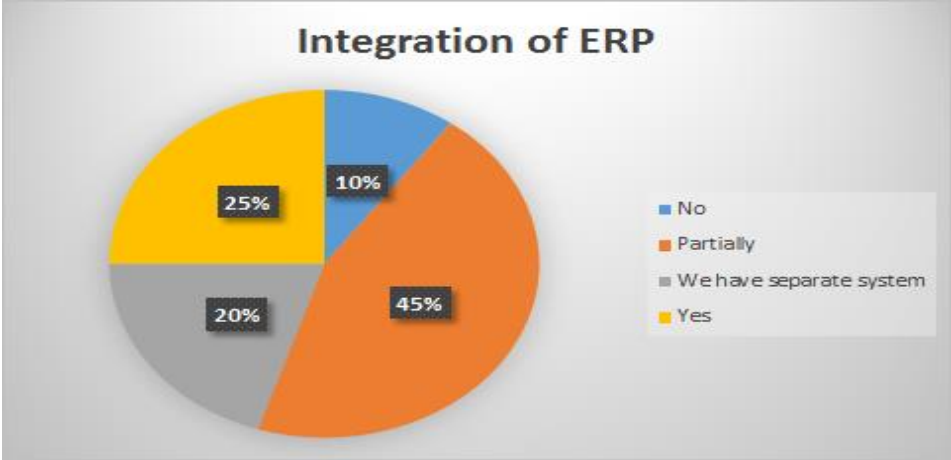
Appendix # 7: Trend of management accounting practices

Management accounting techniques	Nature	Number of response	% of response
Target Costing	Contemporary	9	45%
Business Intelligence	Contemporary	9	45%
Just In Time Inventory (JIT)	Contemporary	7	35%
Balanced Score Card	Contemporary	6	30%
Integrated reporting annual report	Contemporary	6	30%
ABC/TD ABC	Contemporary	5	25%
Sustainability Reporting	Contemporary	5	25%
Risk Management	Contemporary	4	20%
SOX Control	Contemporary	4	20%
Lean Accounting	Contemporary	2	10%
Budgeting and forecasting	Traditional	12	60%
Break even (CVP) analysis	Traditional	9	45%
Investment appraisal using NPV/ ARR/ Payback	Traditional	6	30%
Absorption costing	Traditional	4	20%
Variance analysis	Traditional	4	20%

Appendix # 8: Trend of fixed production overhead allocation

Basis of overhead allocation	Number of response	Trend of response
Labor hour rate	11	55%
Activity Base Costing	2	10%
Machine hour rate	2	10%
Machine hour rate	2	10%
N/A	2	10%
Material consumption rate	1	5%
Total	20	100%

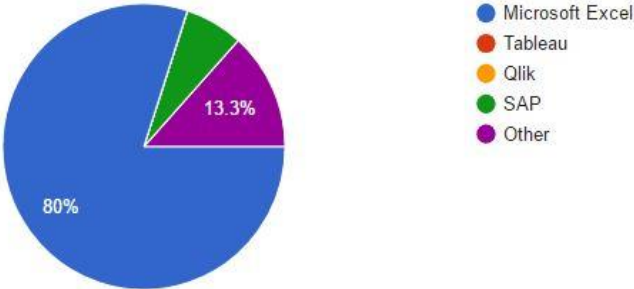
Appendix # 9: ERP integrated - supply chain, manufacturing/operations, human resources, sales, customer services activities:



Appendix # 10: Business intelligence tools

Which business intelligence tool do you use for presentation of financial analysis?

(15 responses)



Appendix -11: Revenue and net income and headcount analysis

Revenue and headcount analysis

Figures are in USD (million)

Year	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Revenue	8	12	11	14	17	21	22	20	22	22	17	11
Net Profit	2	2	1	2	3	5	4	3	2	3	2	1
Year	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	2005
Headcount	38	54	68	88	94	107	112	111	97	83	60	50